

# EXHIBIT GG



**Review of SIPC Risk Profile and Practices:  
The MJK Clearing Event, the Securities Lending Exposure,  
Risk Management Practices and Capital Requirements**

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*Prepared for:*

**Securities Investor Protection Corporation**

31 January 2003

FitchRiskManagement

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**NetRisk**

A division of Fitch Risk Management



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## **Disclosure Statement**

### **Uncertainties**

Risks are inherent in the prediction of future events. Therefore, the accuracy of the findings presented in this report cannot be guaranteed. Although we applied great care in the development and application of our models and assumptions, there exists a probability that unanticipated future events will affect the validity of our findings.

### **Data**

The data used in this study was provided by SIPC, the New York Stock Exchange (NYSE), the National Association of Securities Dealers (NASD) and the Securities and Exchange Commission (SEC). Additionally, we relied on information provided by the Depository Trust Corporation, James P. Stephenson (Trustee, For MJK Clearing), Standard and Poor's, FitchRatings, Ibbotson Associates, Risk Management Association (RMA), and other sources of information. We did not independently verify the accuracy and completeness of all data sources and relied on the integrity of the information.

### **Best Effort**

Notwithstanding the preceeding limitations, the findings and recommendations presented herein provide our professional opinion regarding the topics covered in this report.



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## 1 Overview and Project Objectives

The Securities Investor Protection Corporation ("SIPC") has engaged Fitch Risk Management ("FitchRisk") to conduct a review of the failure of MJK Clearing, Inc. and to evaluate SIPC's risk management practices.

To perform this study, FitchRisk researched and analyzed the following areas:

- The MJK Clearing failure
- Characteristics and mechanisms of the US securities lending markets
- Internal risk control practices applied by broker-dealers
- The regulatory framework and key rules (e.g. Rules 15c3-3, 15c3-1)
- SIPC's overall risk exposure to securities lending transactions
- Evaluation of SIPC's risk management procedures
- Analysis of SIPC's aggregate risk exposure
- Assessment of the adequacy of the SIPC fund

Based on our findings, this study offers conclusions and recommendations that may assist SIPC in its discussions with members and regulators and management of the fund.

**FitchRisk's assignment consisted of two separate studies, Study I and Study II, as described in the following paragraphs. As several elements of Study I and Study II are interrelated, FitchRisk combines the findings of the two studies within this single report.**

### **Study I**

MJK Clearing, Inc. ("MJK Clearing") failed in September 2001 after experiencing large losses related to the collapse of Native Nations Securities, Inc., a small New Jersey based broker-dealer. Previous to its failure, MJK Clearing had entered into outsized securities borrowing transactions with Native Nations, which involved speculative grade bonds and highly volatile equities as guarantees. Native Nations initiated the original transactions, seeking cash loans and pledging the securities as collateral.

In September 2001, the value of the collateral held by MJK Clearing dropped sharply. Attempts to recall the transactions failed, as Native Nations was no longer conducting business at that moment.

With losses upward of \$80MM, the failure of MJK Clearing resulted in the largest loss in the history of SIPC. Given the size and nature of its member base (6,791 firms as of year-end 2001) occasional failures are inevitable. However, in over 75% of failures where SIPC payments are required, net advances amount to \$1MM or less.



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The magnitude of MJK Clearing's loss, coupled with the fact that there were no warning signs of the impending failure is a concern for SIPC's management and board of directors. In light of the events, SIPC seeks to review its overall exposure to securities lending transactions, identify other areas with similar risk potential and examine the effectiveness of current regulatory rules.

## **Study II**

SIPC seeks to review its current internal risk management practices and assess the effectiveness of the present framework. Through its member firms, SIPC is exposed to a wide variety of risks, which given its restricted authority, SIPC is currently not proactively managing. SIPC's board of directors is looking to evaluate the current risk management procedures, and if appropriate, to formulate risk management objectives that are commensurate with SIPC's unique role within the securities industry.

As part of Study II, SIPC is looking to determine the adequacy of its reserve fund. The overall value of the SIPC fund amounted to \$1.18 billion at the end of 2001. Additionally, SIPC has access to additional liquidity of \$2 billion in case the fund should become exhausted due to large losses. The annual fees are currently set at a flat fee of \$150 per member firm. Membership fees and investment income derived from investments of the reserve fund represent SIPC's main sources of income. SIPC's board of directors wants to ensure that the current level of the fund and the available liquidity lines remain sufficient given the current risk characteristics of the overall securities industry.



## 2 Implications of the of MJK Clearing Failure

### Overview

The failure of MJK Clearing offers an important illustration of the potential hazards associated with weak internal controls and a static regulatory framework when compounded by a deteriorating market environment. Several internal and external factors contributed to the ultimate collapse of MJK Clearing. Internal factors refer to the specific deficiencies prevalent at MJK Clearing. These factors may be applicable to other securities firms to varying degrees. External factors describe the regulatory environment and the general economic climate that is relevant to all firms.

### Internal Factors

- Weak control mechanisms at MJK Clearing
- Insufficient risk awareness
- Failure to assess the relationship between the borrower and the collateral pledged to guarantee a loan
- Moral hazard and adverse selection

### External Factors

- Deterioration in the economic environment
- Regulatory framework that is both passive and static
- Inadequate regulatory rules

A more detailed analysis of these factors, in the context of MJK Clearing and the securities industry in general, is presented in the remainder of this section. Additionally, we evaluate the implications of these issues from SIPC's perspective.

Our findings are based on our professional judgment and supported by various third-party documents. It is important to note that throughout the report the term 'securities lending' is used interchangeably to describe both securities lending and borrowing activities.

### SIPC's Perspective

SIPC main purpose is to promote investor confidence by providing certain guarantees to the customers of failing securities firms. SIPC's core business is to administer and manage a reserve fund to replace missing customer assets of failing member firms. As is true for any guaranty fund or insurance portfolio, effective management of contingent liabilities requires the exercise of three core tools – controlling the risk, effectively monitoring the exposure, and



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pricing the risk on a risk basis. Hypothetically, if SIPC operated as a private, for-profit entity, it would perform the following core tasks:

- **Controls** – SIPC would be able to establish effective controls on its members to prevent risk-shifting through moral hazard, adverse selection and other actions of the members that impose losses on the fund and other participants.
- **Monitoring** – SIPC would apply effective monitoring tools to understand the reserve fund's ongoing exposure rather than being informed only after a loss has already been incurred.
- **Risk-based premiums** – To compensate the fund for any exposure that cannot be eliminated through monitoring or controls, SIPC would charge premiums based on the risk assumed.

However, given its unique mandate and limited resources, SIPC is not by itself in the position to perform all these functions effectively. In order to address this disadvantage, it is crucial that SIPC leverage the risk management resources of the regulatory entities that are better positioned to perform these functions, namely, the Securities and Exchange Commission ("SEC") and the major Self-Regulatory Organizations ("SROs").

### **Internal Control Procedures**

According to the Trustee's complaint<sup>1</sup>, MJK Clearing's senior management failed to implement basic control structures to monitor the business and reporting practices of the securities loan department. In the absence of adequate supervision, the firm's securities lending exposure grew in an unsupervised fashion. For instance, management was unaware of the continuously increasing mark-to-market discrepancies in the securities lending book. The discrepancies existed for several months prior to the firm's failure but management only became aware of the problems when it was too late to salvage the company.

According to a document issued by a SEC, NYSE, and NASD task force<sup>2</sup> in 1999, the MJK Clearing situation is not unique. In the document, the task force reported the findings of a review of broker-dealers. The examination staff discovered various instances of questionable control practices, including: 1) Failure to audit entire functional areas 2) Inexperienced and understaffed internal audit departments, and 3) Instances of department heads overseeing the risk monitoring process of their own business units.

<sup>1</sup> United States Bankruptcy Court District of Minnesota - James P. Stephenson, Trustee, For MJK Clearing, Inc. ("Trustee", "Plaintiff") v. Eldon C. Miller, David B. Johnson, John E. Feltl, Todd W. Miller, Jeffrey L. Houdek, Thomas Brooks ("Defendants"), Adv. Proc. No. 01-4257 - Complaint

<sup>2</sup>JOINT STATEMENT: BROKER-DEALER RISK MANAGEMENT PRACTICES – Office of Compliance Inspections and Examinations, Securities and Exchange Commission, New York Stock Exchange, NASD Regulation, Inc. – July 29, 1999





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The situation prevalent at MJK Clearing appears consistent with these findings. As a result, it is likely that the control procedures at other securities firms are similarly incompatible with best practices.

### **Risk Management Practices**

MJK Clearing extended cash loans in excess of \$200MM to Native Nations, a securities firm with equity capital of approximately \$5MM. In September 2001, this single exposure accounted for over 23% of MJK Clearing's total assets. The magnitude of this exposure to any individual counterparty violates basic risk management principles. Furthermore, MJK Clearing failed to adequately analyze the market or liquidity risks associated with the collateral it received to guarantee the loans.

On the most basic level, all financial firms should have procedures in place to approve counterparties and establish notional credit limits. Additionally, firms should establish exposure limits for business units and assess the quality of the collateral they hold. According to the Trustee's complaint filing, MJK Clearing never established such procedures.

In the same task force report cited earlier, the SEC, NYSE and NASD examination staff documented similarly weak risk management procedures at other brokerage firms. Credit risk is singled out as an area of special concern for securities firms. The staff's findings included several instances of trading activities with counterparties for which no formal credit limits were established. Additionally, many of the computer systems used to process the transaction data were outdated, or their capabilities too limited to accurately reflect a firm's true risk profile.

A useful approach to evaluate and manage counterparty risk is presented in a document published by the *Counterparty Risk Management Policy Group* ("CRMPG"). The group was formed with the purpose of improving internal credit evaluations in the securities industry in the wake of the near-collapse of LTCM in 1998. In its guiding document<sup>3</sup>, the CRMPG proposes a comprehensive framework consisting of the following six building blocks:

- Stronger internal limit setting, collateral margin, and other credit risk management practices
- Improved internal risk transparency for senior management and regulators
- Enhanced information sharing between counterparties
- An analytical framework for evaluating the effects of leverage on market liquidity and credit risk
- Improved credit risk estimation techniques
- Stronger and harmonized market conventions for close-outs and other key credit documentation practices

<sup>3</sup> IMPROVING COUNTERPARTY RISK MANAGEMENT PRACTICES, June 1999 - Counterparty Risk Management Policy Group ("CRMPG") – SEC and Federal Reserve endorsed founding of the group consisting of 12 internationally active commercial and investment banks



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In addition to improved internal risk management processes, the CRMPG Report suggests basic regulatory reporting guidelines. For instance, the disclosure of firm's 10 largest counterparty exposures is recommended as part of the regulatory reporting process. Overall, the framework addresses the most important risk factors contained in trading and lending activities and is directly applicable to securities lending operations. As such, the CRMPG Report provides a good starting point for the development of minimum risk management guidelines for the securities industry.

### **Relationship between Borrower and Collateral**

The failure of Native Nations transpired shortly after a sharp decline in the value of GENI shares. While the simultaneous occurrence of the events might have been a coincidence, it is reasonable to deduce that there existed high correlation between the two exposures.

From MJK Clearing's perspective, it would have been prudent to at least question the role of a small securities firm acting as the dominant intermediary of relatively illiquid securities. Small securities firms generally will not apply the same level of scrutiny to the activities of its employees as imposed by the compliance departments of large firms. Transacting through a relatively obscure firm is therefore a logical choice for someone who intends to manipulate securities.

Evaluating the relationship between a borrower and the underlying collateral is a complex task and does not necessarily yield exact results. Nevertheless, it is crucial that securities firms are aware of the risks and address them appropriately. In some instances *borrower-collateral correlation* can be observed and captured directly. This is the case when actively traded securities for both the borrower and collateral are outstanding. In other situations, such as in the Native Nations-GENI exposure, the circumstances resulting in high correlation are less obvious and can only be qualitatively assessed.

### **Moral Hazard and Adverse Selection**

When MJK Clearing initially entered the securities lending market, the compensation scheme offered to the head of the department, Mr. Thomas Brooks, was not structured in a manner that would have rewarded risk awareness or risk avoidance. As a result, Mr. Brooks' priorities differed significantly from the objectives of the company's owners. With his personal compensation directly tied to the net income produced by his department, Mr. Brooks had strong incentives to generate the largest returns, regardless of the risks involved. As a general rule, higher returns are associated with higher risks, which in this case were fully borne by the firm's shareholders. In the absence of any meaningful exposure limits, Mr. Brooks' compensation package introduced a significant degree of moral hazard. Moral hazard represents the situation in which individuals can take actions to improve their position by shifting risk to others, where such actions are unobservable to the ultimate risk-bearers. In this case, the compensation structure at MJK Clearing provided incentives for Mr. Brooks to take risks with large upside benefits for him personally, but at the expense of increasing the risk to shareholders.



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Given the evidence presented in trustee's legal filings, it is reasonable to assume that Mr. Brooks attempted to maximize his personal compensation by exposing MJK Clearing to inappropriate risks.

Related to moral hazard is the condition of 'adverse selection'. This term is frequently used in insurance and credit markets to describe the following situation:

*'The tendency of borrowers who present a poorer-than-average risk to apply for credit to a greater extent than those with better than average risk characteristics, in the absence of appropriate evaluation of borrower riskiness.'*

The reason for the frequent occurrence of such conditions is straightforward; small counterparties, such as Native Nations, have only few opportunities to obtain considerable credit lines. When offered the chance they are more likely to accept the offer than a well-established institution, which can choose among many counterparties willing to conduct business.

In order to avoid moral hazard and adverse selection, an increasing number of firms base compensation and performance evaluation on risk-adjusted returns. Risk-adjusted returns reward managers to seek out low-risk opportunities with attractive returns, instead of aiming for the highest possible short-term gains.

Implementing the proper incentives and aligning the objectives of managers and owners is a complex task. Regardless of the chosen framework, shareholders have to evaluate their own risk tolerance and implement appropriate control structures.

### **Economic Environment**

Securities markets in general have become riskier during the past two years due to high market volatility and increasing default rates. The rapid erosion of market values for many firms has prompted increased lending/borrowing activities in a large range of securities and as a consequence, securities firms can no longer assume that collateral provides full protection in the case of a counterparty default.

According to the Trustee's complaint, MJK Clearing's external auditors (Ernst & Young) issued a statement<sup>4</sup> in May 2001 that specifically raised the issue of increasing risks associated with securities lending operations in a harsh economic climate. However, MJK Clearing's senior management neglected to take any meaningful steps to adapt to a riskier market environment. Fitch Risk Management did not have the opportunity to review the report prepared by the external auditors and has to rely on the description provided in the Trustee's complaint.

<sup>4</sup> According to the Trustee's complaint filing, an E&Y report was issued to the board of directors on May 8, 2001.



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### Regulatory Actions

The SEC has actively participated in several undertakings to address risk management practices<sup>5</sup> and the effectiveness of the Net Capital Rule<sup>6</sup>. However, these initiatives concluded either in rules applicable to only a small category of dealers or in recommendations, rather than mandatory rules. Hence, financial requirements and disclosure rules for a majority of securities firms have remained unchanged over the past few years.

During an extended period of strong economic growth, regulators, market participants and politicians who supervise the Commission's activities, may have overlooked the significance of a firm regulatory framework. A recent article in the New York Times<sup>7</sup> details the neglect the SEC has suffered over the past several years. The workload of Commission employees has increased excessively and has resulted in noticeable delays of regulatory decisions and proposed rule changes.

The current regulatory situation is challenging for SIPC from a risk management perspective. To manage its fund effectively, SIPC must rely on the SEC to adapt its reporting and monitoring capabilities to address the increasing complexities of SIPC's members' activities. Given the inadequate resources available to the SEC, SIPC cannot be certain that this is always the case.

### Regulatory Rules

As required by the SEC, MJK Clearing filed monthly FOCUS reports with its regulatory authority, the NASD. Despite a large increase in MJK Clearing's securities lending activities, regulators did not detect any irregularities in the period leading to MJK Clearing's failure. The key rules intended to ensure the financial integrity of securities firms, the **Customer Protection Rule** (15c3-3) and the **Net Capital Rule** (15c3-1) are both part of the FOCUS report filings.

As relates specifically to the MJK Clearing case, Native Nations and other securities firms are considered non-customers and are therefore excluded for the purpose of the **Rule 15c3-3** computation.

**Rule 15c3-1** requires that securities firms maintain a minimum level of liquidity. The firm's net capital is the basis for the computation. Net capital is affected by securities lending/borrowing exposures, which are entered as asset and liability items on the firm's balance sheet. However, as long as the transactions are fully secured and/or the positions are matched (e.g. lending and borrowings are of equal size) the net capital number will remain unchanged.

Although questions remain regarding the accuracy of various MJK Clearing FOCUS filings, SEC Rules 15c3-1 and 15c3-3 do not reveal the credit and market risks inherent in non-

<sup>5</sup> S.E.C Final Rule: OTC Derivatives Dealers Release No. 34-40594; File No. S7-30-97

<sup>6</sup> S.E.C Concept Release No. 34-39456; File No. S7-32-97

<sup>7</sup> NYT, Saturday, July 20, 2002 - S.E.C IS SUFFERING FROM NONBENIGN NEGLECT, Author: Stephen Labaton



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customer securities lending exposures. Without additional disclosures regarding the composition of the securities lending/borrowing portfolios, regulators are unable to determine the risk potential associated with this business activity.

### **Implications for SIPC**

From SIPC's perspective, risk exposures related to members' securities lending activities have grown significantly over the past five years. Several key factors contribute to this development, including:

- **Higher exposures** – Notional securities borrowing exposures have grown significantly, especially among NASD regulated firms. Overall, they currently account for 29% (\$878 billion) of the average assets of clearing firms.
- **Weak economic climate** – Firms are more likely to default in a weak economic climate.
- **Uncertain collateral value** – Financial markets have experienced significant weakness in the recent past. Equities and corporate bonds have suffered the most, resulting in depressed market values for collateral.
- **Counterparty concentration risk** – This is perhaps the most crucial single factor. Given current regulatory rules, it is impossible for SIPC to capture the level of risk concentrations assumed by its members. Conceivably, the MJK Clearing situation represented an isolated incident but there is no assurance that this is the case.

SIPC relies on the SEC and by extension the SROs to develop and enforce reporting rules and regulations. SIPC should support any regulatory rules intended to improve the disclosure of its members counterparty credit risk. An accurate reflection of these risks would greatly improve the confidence in the financial integrity of its members.

### **Summary**

The failure of MJK Clearing contains valuable lessons for all security market participants. A combination of inadequate control mechanisms, absence of risk management procedures and a static regulatory framework increase the probability of undesirable outcomes.

It is evident that MJK Clearing's securities lending officer should have been prevented from building up a disproportionate exposure to a weakly capitalized single counterparty. MJK Clearing's senior management failed to implement basic control structures and thereby put the capital of the firm and SIPC funds at risk. While the MJK Clearing example presents an extreme event, it cannot be assured that it was an isolated incident. Given the SEC, NYSE and NASD report cited earlier in this chapter, it would be irresponsible to simply assume that all other securities firms are assessing their risk exposures in an adequate fashion.

The CRPMG framework proposes a simple regulatory reporting procedure that would help to significantly improve the understanding of credit risks assumed by securities firms. Under such a framework, firms would be required to provide detailed information on their largest



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single counterparty exposures. If this type of information were made available to the SEC (and SIPC), the task of determining the adequacy of the SIPC fund could be accomplished in a more efficient fashion.

Regardless of the exact nature of new regulations, it is crucial that they help enhance SIPC's position as a guarantee provider. From SIPC's perspective, all initiatives should include elements that improve the effectiveness of its key management tools: **control** and **monitoring** of exposures and the **pricing** of its guarantees.



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### 3 Overview of the MJK Clearing Incident

#### 3.1 Highlights

*As part of Fitch Risk Management's assignment, we conducted an in-depth review of the failure of MJK Clearing, Inc. The evidence presented in this section is based on financial reports and the legal complaint filed by the trustee of MJK Clearing.*

In January 1999, MJK Clearing hired Thomas Brooks as Vice President with the mandate of heading up a profitable securities lending operation. He received a generous compensation package, which included a base salary and a bonus equal to 30% of the net income generated from securities lending activities.

Absent of any comprehensive control procedures, Mr. Brooks proceeded to quickly grow MJK Clearing's stock lending business. Due to MJK Clearing's relative small size, which made it difficult to conduct high transaction volumes with larger counterparties, Mr. Brooks relied on business with small, undercapitalized securities firms such as Native Nations to produce revenues for his department.

In November 2000, a stock lending employee at *Freeman Securities* (the firm was subsequently acquired by *Native Nations* in early 2001) contacted Mr. Brooks and initiated the first transaction involving shares of *GenesisIntermedia, Inc.* (Nasdaq: GENI). GENI was a tightly held infomercial and telemarketing company. Insiders held in excess of 80% of total GENI shares outstanding for most of the time of MJK Clearing's involvement.

At the time of the first transaction, the *Freeman Securities* employee directed Mr. Brooks to re-lend the shares to another small New Jersey based brokerage firms, *Maple Partners U.S.A., Inc.*, as illustrated in Exhibit 1. MJK Clearing received a fee for its participation in this transaction.

Exhibit 1





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During the course of 2001, Mr. Brooks continuously increased MJK Clearing's exposure to *Freeman/Native Nations* by entering into additional transactions with similar characteristics. Several of these transactions involved Imperial Credit ("Imperial") bonds as collateral. By March of 2001, *Maple Partners* dropped out of the transactions and was subsequently replaced by other security firms, including *E\*Trade* and *Nomura Securities*.

In May 2001, these counterparties contacted MJK Clearing to notify them that the value of Imperial bonds had dropped in value. As is standard industry practice, they demanded payments of approximately \$3.5MM from MJK Clearing in order to balance the exposure. Customarily, MJK Clearing would have demanded payment of the same amount from *Native Nations* and forwarded the payment to its counterparties.

Instead, MJK Clearing failed to receive a payment from *Native Nations* but nevertheless agreed to send the amounts demanded to its lending counterparties. Over the next three months, these discrepancies increased on a continuous basis. By August 2001, MJK Clearing had submitted total payments of \$15.9MM relating to Imperial bonds, without receiving any payments from *Native Nations* in return.

On July 27, 2001, the mark-to-market discrepancies were internally discovered in an "*Open Contracts by Account*" report. However, apparently no action was taken to determine the exact cause for the discrepancies. MJK Clearing's FOCUS report filing at the end of July did not contain any apparent irregularities.

During the course of two weeks in September 2001, shares of GENI lost 40% of their value. MJK Clearing's counterparties demanded payments exceeding \$50MM to rebalance the positions. Again, MJK Clearing paid the amounts demanded without receiving any payments from *Native Nations, Inc.* On September 24, 2001, MJK Clearing management discovered the losses and made frantic efforts to collect the amounts due from *Native Nations*. As *Native Nations* was no longer conducting business at that moment, these efforts failed.

To complicate the situation, after the close of the stock markets on September 25, 2001, trading of GENI shares was halted, pending an investigation by securities regulators. The investigation uncovered massive manipulations by *GenesisInteractive's* management. When trading of GENI shares resumed, the opening price was approximately 95% below the previous closing value. Collateral held by MJK Clearing at that moment was essentially worthless.

The losses experienced by MJK Clearing were fatal as they exceeded the firm's capital base multiple times. Additionally, several other broker-dealer companies suffered substantial losses related to MJK Clearing's insolvency.

### 3.2 Analysis of Financial Data

MJK Clearing financial data reveals several noteworthy characteristics, including:

- Outsized concentration to a single counterparty





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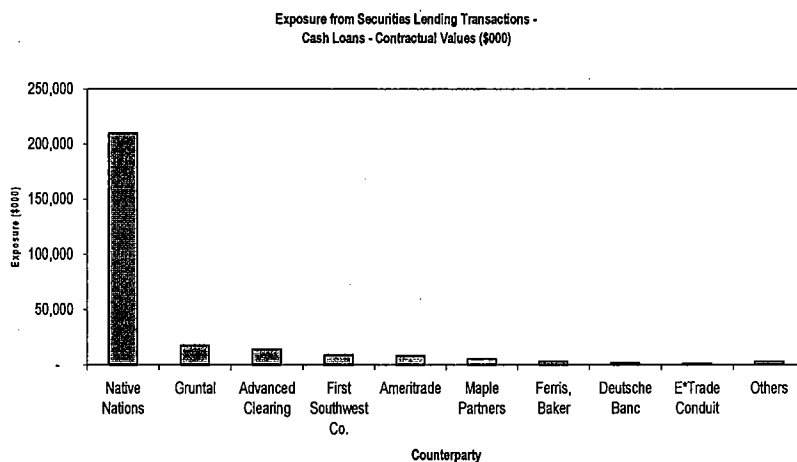


- Relatively high-non customer securities lending/borrowing exposure compared to industry levels
- Weak capitalization compared to industry benchmark

### Concentration

Perhaps the most striking observation concerning MJK Clearing's financial data involves the exaggerated exposure to Native Nations. Cash loans to Native Nations amounted to \$209 million, or close to a quarter of MJK Clearing's total balance sheet. By contrast, exposure to the second largest cash borrower was approximately 12 – times smaller (Exhibit 2). This lack of diversification would be a problem for any financial firm. Given that Native Nations was a securities firm with a capital basis of approximately \$5 million, the size of the exposure was unreasonably large by any measure.

### Exhibit 2



### Non-Customer Securities Borrowing

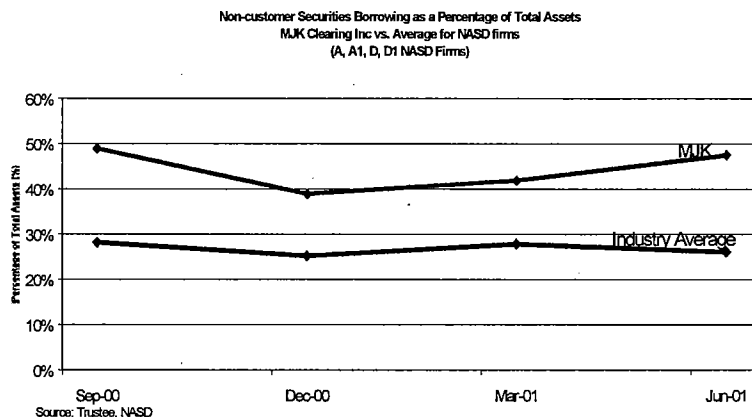
MJK Clearing's non-customer securities lending exposure was consistently higher than relevant industry averages. On average, for NASD regulated self-clearing firms, securities borrowed accounted for approximately 26% of the balance sheet. By contrast, MJK Clearing's securities borrowing activities amounted to 45% of total assets.



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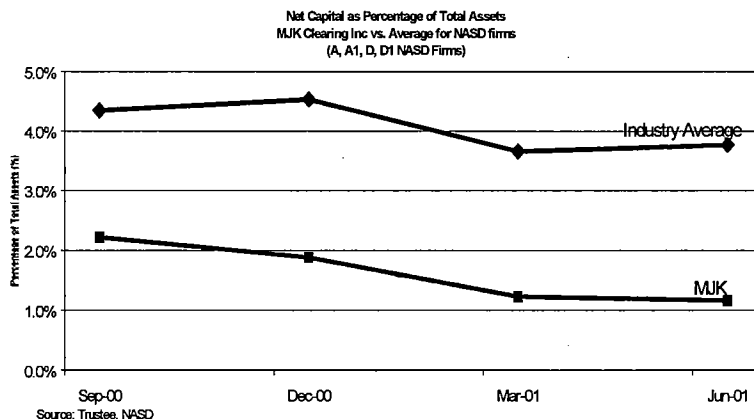
### Exhibit 3



### Capitalization

Compared to a peer industry group, MJK Clearing capitalization was relatively weak. On average, ownership equity accounted for approximately 4% of firm's total assets. In comparison, MJK Clearing's equity accounted for less than 2% of the company's total assets. A higher level of capitalization would have helped to reduce SIPC's loss exposure. However, given the magnitude of the damages experienced by MJK Clearing, even a vastly higher capitalization ratio would have been insufficient to eliminate all losses.

### Exhibit 4





## 4 The Securities Lending Business

### 4.1 Overview

Security lending transactions are typically structured in one of two ways:

- Repurchase agreement (Repo)
- Securities borrow/loan

While both transaction types involve the exchange of securities for cash (or other collateral), there are important differences between these structures. Over 95% of all repo transactions involve short term financing arrangements by dealers, banks or institutional investors and involve highly rated securities (e.g. treasury or agency securities). Due to the short maturities and the quality of the collateral, credit and market risks in repo transactions are generally small. The repo market is efficient, governed by Master Agreements with standard terms that define the obligations and rights of the counterparties involved. Total market size in the US is estimated between \$3 – 4 trillion.

By contrast, the scope of security lending transactions is much more diverse. Security lending transactions are generally conducted to support trading activities (e.g. short sales) involving specific securities. Security investors on the other hand are interested in lending out securities to generate additional income. As evidenced by various MJK Clearing deals, securities lending transactions can involve virtually any type of security.

The following sections describe the securities lending industry for open-term transactions and are not representative for the repo markets.

### 4.2 Business Practices

Security lending transactions are either initiated by a need to borrow a specific security (security-driven transaction) or the need to raise cash (cash-driven transaction). The transactions involving MJK Clearing and Native Nations were cash-driven. Native Nations originally initiated the transactions in order to obtain cash loans.

In the US markets, dealer-to-dealer security lending transactions are conducted on an over-the-counter (OTC) basis. This means that securities firms are the legal counterparties to the transactions, rather than a clearinghouse. Consequently, all securities lending exposures involve some elements of credit risk. Even the most highly rated securities firms are not considered to be entirely risk-free. Hence, collateral quality is essential, as its liquidation value will determine the financial outcome of a transaction in the case of a counterparty default.

Most often, lending departments of broker-dealers directly negotiate terms and conditions of the transaction via phone or fax. This was the case in the transactions involving MJK Clearing and Native Nations.



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A unique characteristic of securities lending transactions is the uncertainty regarding the reversal of the transaction. Unlike repos, where the timing of the transaction recall is predetermined, securities lending transactions are conducted on an "open term" basis. This means that the lending arrangement will stay in place until one of the counterparties cancels the transaction. In order to reverse the transaction, the canceling party has to notify its counterparty and the recall leg of the transaction will occur on a T+3 basis.

The economic terms of securities lending transactions are driven by the objectives of the initiator of the transaction and the demand/supply situation for specific securities. The lending market for many large cap equities and liquid government securities is well developed and fees are generally modest. Larger fees can be earned by borrowing or lending illiquid securities, as was the case with MJK Clearing's GENI transactions. However, larger fees are generally associated with higher risk exposures as the liquidation value of the collateral is less certain than with large cap equities or government securities.

### 4.3 Market Size

As is the case for many OTC markets, it is difficult to determine the exact size of the securities lending market. A survey conducted by the Risk Management Association<sup>8</sup> (RMA) publishes data of 19 of the largest securities lenders. According to the survey, the participants had \$405 billion in US securities on loan during the fourth quarter of 2001. Based on this survey and estimates from other sources (e.g. BIS, Penryth), we estimate total outstandings in the US markets between \$1.2 - \$1.7 trillion.

### 4.4 Securities on Loan

According to the same RMA survey cited above, fixed income products account for about 70% of the collateral involved in the US securities lending industry (Exhibit 5). We believe that the survey results offer a good proxy for the asset mix of the overall US market.

The two asset categories with the largest potential for excessive volatility are corporate bonds and equities. Although many highly rated corporate bonds are relatively secure, non-investment grade bonds can be very volatile, especially in the current investment climate.

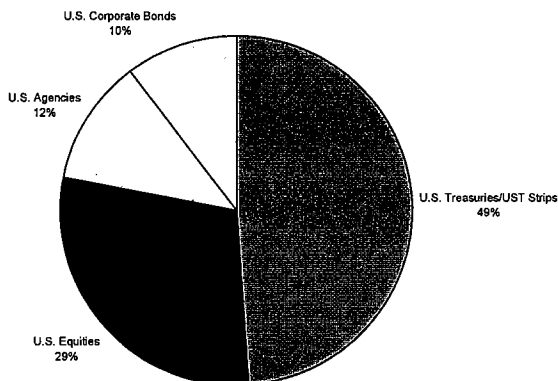
<sup>8</sup> RMA Quarterly Securities Lending Aggregate Data Survey



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## Exhibit 5



### 4.5 Participants

On the most basic level, market participants can be divided into their functions as principals and agents. Principals are the legal counterparties of the transactions and agents facilitate transactions on behalf of third parties. Many entities such as custodian banks will take on both roles, acting as principals for their proprietary book and at the same time arranging transactions as agents for their large institutional clients.

#### *Principals*

All major security firms maintain active security lending desks. They make markets for a wide range of securities and account for a large percentage of the total trading activity. Major firms hold large inventories and borrow/lend securities based on the positions held by their proprietary trading desks and the needs of their customers. Firms with large investment portfolios such as insurance companies, mutual funds and pension funds are lending out securities to enhance their portfolio yields.

Principals enter transactions in four distinct roles as described in Table A.



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**Table A**

<b>Activity</b>	<b>Major Principal Parties</b>	<b>Main Rationales</b>
<i><b>Security Borrowing</b></i>	<ul style="list-style-type: none"> <li>▪ Broker-dealers - 3<sup>rd</sup> party arrangements (e.g. for customers, prime broker, exclusive lending arrangements, etc.)</li> <li>▪ <b>BROKER-DEALERS (PROPRIETARY) [MJK CLEARING]</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Support short selling strategies</li> <li>▪ Facilitate market-making activities</li> <li>▪ Cover failed deliveries</li> <li>▪ <b>TRADING ACTIVITY</b></li> </ul>
<i><b>Security Lending</b></i>	<ul style="list-style-type: none"> <li>▪ Pension funds</li> <li>▪ Insurance companies</li> <li>▪ Mutual funds</li> <li>▪ Banks</li> <li>▪ Broker-dealers</li> </ul>	<ul style="list-style-type: none"> <li>▪ Yield enhancement</li> <li>▪ Trading activity/Profit center</li> </ul>
<i><b>Cash Borrowing</b></i>	<ul style="list-style-type: none"> <li>▪ <b>BROKER-DEALERS [NATIVE NATIONS]</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Finance trading positions</li> <li>▪ <b>INEXPENSIVE FUNDING</b></li> </ul>
<i><b>Cash Investing</b></i>	<ul style="list-style-type: none"> <li>▪ Broker-dealers</li> <li>▪ Banks</li> </ul>	<ul style="list-style-type: none"> <li>▪ Short term secured investing</li> </ul>

## **Agents**

Agents execute securities lending deals on behalf of their clients but are not the legal counterparties to the transactions. Many institutional investors use broker-dealers or custodians to represent their interests in the area of securities lending. Large custodian banks such as State Street and Bank of New York are very active in this area and offer a variety of fee-based services to their customers.

Generally, only very large institutional investors maintain their own securities lending operations. Profit margins are relatively small and sizeable transaction volumes are required to warrant the expenses associated with running a proprietary lending desk.

Interdealer-brokers (IDBs) act as agents on behalf of major market participants by helping them locate specific securities or investment opportunities. IDBs are paid fees based on transaction volumes intermediated on behalf of their clients.



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**Table B**

<b>Agents</b>	<b>Services Offered/Tasks Performed</b>
<i>Broker-Dealers</i>	<ul style="list-style-type: none"><li>▪ Agency lending services</li></ul>
<i>Custodians</i>	<ul style="list-style-type: none"><li>▪ Securities lending management</li><li>▪ Risk management functions</li><li>▪ Reporting</li></ul>
<i>Inter-dealer brokers</i>	<ul style="list-style-type: none"><li>▪ Identify lending/borrowing opportunities on behalf of broker-dealers and banks</li><li>▪ Trade matching and confirmation services.</li></ul>

#### **4.6 Transaction Clearing and Processing**

Following the close of a transaction, details are forwarded to the NSCC/DTC system where cash and securities are cleared according to instructions. Most active market participants use automated trade processing services such as *Loanet* or *EquiLend* to transmit transaction instructions.

From the view of the NSCC/DTC, the clearing and settlement process is the same as for regular buy/sell transaction. While the DTC offers securities lending tracking capabilities, they are voluntary and not used by all market participants. The DTC does not monitor securities lending exposures of members and executes fund transfers only after receiving explicit instructions.

#### **4.7 Collateral Management**

In the US market, collateral management is governed by standard legal agreements. It is standard practice to revalue collateral on a daily basis. Depending on the new values of the collateral, payments of cash or delivery of additional securities occur the following day. Generally, the party which holds the claim to an adjustment issues a notification to its counterparty.

For liquid collateral such as government securities or actively traded stock, marks are generally easy to establish. Discrepancies often result from exposures to illiquid stocks or bonds (Imperial Credit, etc.) where accurate marks are difficult to observe.

#### **4.8 Risk Management Practices**

Risk management processes among SIPC members vary drastically. While the largest investment banking firms are at the forefront of innovation, many of the smaller firms have



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only vague grasps of appropriate risk management processes. This is especially true in the area of credit risk.

Historically, securities firms have mostly lent on a fully collateralized basis. Additionally, daily mark-to-market processes ensure that the values of the exposures are frequently balanced. Assuming that counterparties are creditworthy, collateral is of high quality and proper mark-to-market practices are applied, the risks of securities lending transactions are relatively minor. However in the case of weakly capitalized, highly leveraged security firms, there is no margin for error as demonstrated by the MJK Clearing case and risk management is of major importance.

At a minimum, most securities firms are expected to perform a formal credit evaluation of their counterparties before entering into transactions. Subsequently, a review of the counterparty credit is performed on an annual basis. After a counterparty has been approved, exposure limits are applied based on the size and credit worthiness of the firm. Additionally, collateral will be analyzed based on several characteristics, including price volatility, liquidity and default risk.

#### **4.9 Major Developments and Market Outlook**

Security lending has become an important component of modern capital markets. A well functioning market assists in the orderly settlement of securities transactions and provides liquidity for market makers and short sellers. Additionally, the market provides additional yield for institutional investors with large lending portfolios.

Operationally, securities lending remains much more complicated than simple buy/sell transactions and several transaction maintenance and termination functions still require human intervention. Although there are several electronic trading initiatives underway to introduce increased efficiency into the securities lending market, most of the platforms are just starting to emerge. One development is the launch of *EquiLend, LLC*, a consortium of 10 major financial institutions. *EquiLend* was launched at the end of July 2002 and processed over \$11 billion in the first two weeks of its existence. Additionally, CalPERS and Old Mutual are set to launch an auction system for securities lending termed *eSecLending, LLC* later this year.

The introduction of these systems will increase efficiency and transparency in the security lending process and automate several back-office tasks. However, in terms of market and credit risk exposures the systems will not significantly improve current business practices.

Additionally, a broadly based initiative coordinated by the Securities Industry Association (SIA) is currently underway to move settlement terms of lending recalls to a T+1 environment. Although timing of a T+1 implementation remains uncertain, this will eventually further improve liquidity and remove the uncertainties associated with lengthy settlement terms.





## 5 Regulatory Framework

### 5.1 Background

US securities firms are regulated directly by the SEC and by private membership organizations called self-regulatory organizations or SRO's. The private self-regulatory organizations (SROs) are mandated by Congress to enforce rules guiding the conduct of their members and to enforce SEC rules. With few exceptions, all broker-dealers have to register with at least one SRO. The two most prominent SROs are the National Association of Securities Dealers (NASD) and the New York Stock Exchange (NYSE). Many members who hold seats at a major securities exchange are dual members of the NASD and the national exchange to which they belong.

The main objective of the regulatory process centers on the three pillars that ensure that securities firms' apply sound business practices:

- 1) Capital Adequacy – Enforced through the Net Capital Rule to ensure adequate capital and liquidity levels are maintained by broker-dealers
- 2) Examination – SRO's and the SEC periodically review the business practices to ensure compliance with securities regulations
- 3) Market disclosure – Broker-dealers file periodic FOCUS reports with their designated SRO's. FOCUS reports contain extensive disclosures regarding income, balance sheet and regulatory capital

### 5.2 Roles and Objectives of Regulators

#### ***Securities and Exchange Commission***

The primary mission of the U.S. Securities and Exchange Commission (SEC) is to protect investors and maintain the integrity of the securities markets. The Commission's Division of Market Regulation is responsible for the oversight of broker-dealers, SROs, clearing organizations and various other entities that play a major role in the securities markets.

The Division's main responsibilities include:

- Carrying out the financial integrity program for broker-dealers
- Reviewing and approving proposed new rules and proposed changes to existing rules filed by the SROs
- Establishing rules and issuing interpretations on matters affecting the operation of the securities markets



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- Market surveillance

The Commission regularly reviews the performance of the SROs and all proposed rule changes must be submitted and approved by the SEC before going into effect.

Additionally, SEC staff actively reviews securities firms, which were previously subject to SRO examinations and also randomly selects companies for review. In the event of irregular or unusual activities, the SEC has the authority to recommend specific actions to be taken by the designated SRO.

### **Self-Regulatory Organizations**

The SROs are mandated with the enforcement of federal securities laws. Additionally, SROs ensure members' compliance with their own rules and regulations, which in some cases are more stringent than SEC rules. All rules of the exchanges or securities associations have to guarantee a fair representation of all of its members. Overall, the SRO model is well entrenched within the US securities industry. However, issues regarding the dual roles played by the major regulators are raised on a frequent basis. Both the NASD and NYSE are owners and operators of their respective market places and at the same time act as the primary regulators of their respective markets. This may potentially result in situations where conflicts exist between the interests of the market operators on one side and those of market on the other side.

### **National Association of Securities Dealers**

With close to 6,000 members, the NASD is by far the largest SRO in the United States. The NASD oversees and regulates all trading on the NASDAQ stock market and over-the-counter (OTC) transactions. All securities professionals and senior officers associated with a member firm are required to register with the NASD.

The NASD uses a computerized monitoring system to process FOCUS report data submitted by its members. The monitoring system produces exception reports in cases where attention by NASD staff is required. Additionally, the NASD maintains the *Public Disclosure Program*, which allows investors to learn about the professional background and business practices of brokers. The NASD evaluates its members' public communications to assure that they are fair and accurate. In the case of a dispute between a member firm and its customers, the NASD provides arbitration and mediation services.

Previous to its failure, MJK Clearing had been a NASD member since 1980. Before being placed in liquidation by SIPC in September 2001, the firm was subject to a total of 11 Regulatory Actions and 3 Arbitration proceedings. The allegations ranged from minor filing violations to the selling of unregistered securities and resulted in fines of \$100 to \$175,000. None of the cases included securities lending transactions.



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### **New York Stock Exchange**

The NYSE is the designated SRO for approximately 250 securities firms. The NYSE continuously monitors conduct and financial conditions of its members which include some of the world's largest securities firms. In cases where potential problems are detected, members are required to remedy the situation within a short period of time. If the problem persists, the NYSE's Division of Enforcement implements its own action plan. Additionally, the NYSE consistently monitors the trading flow on its exchange and includes a computerized system that automatically detects unusual volumes and price changes.



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## 5.3 Regulatory Capital Requirements and Risk Management Practices

Chapter V of the SEC *Compliance Guide*<sup>9</sup> specifies the following requirements:

### V. Financial Responsibility of Broker-Dealers

Broker-dealers must be financially sound. We regulate this through financial responsibility rules that are designed to:

- Provide safeguards with respect to customer funds and securities that broker-dealers hold;
- Ensure accountability for those funds and securities; and
- Require accurate books and records.

These rules also require a broker-dealer to maintain sufficient liquid assets so that, if necessary, it could be liquidated in an orderly manner without a formal proceeding.

As written, the rules focus on customer assets and securities owned outright by securities firms. They do not specifically address non-customer related exposures, which were responsible for the demise of MJK Clearing.

To fully understand the workings of the existing framework, it is helpful to review the implementation of the rules in the context of MJK Clearing, as presented in the following chapters. The data used for the computations below was extracted from MJK Clearing's monthly FOCUS report filings from August 2000 – August 2001.

The filing of a periodic report titled: *Financial and Operational Combined Uniform Single Report* (FOCUS Report – SEC Form X-17A-5) is the main process to monitor the financial health of broker-dealers. In the FOCUS report, broker-dealers are required to disclose balance sheet information and perform various computations to demonstrate adequate financial strength. The reports are filed with the designated SRO, the NASD in the case of MJK Clearing.

### **Reserve Computation (Rule 15c3-3)**

*"This rule protects customer funds and securities held by broker-dealers. Under the rule, a broker-dealer must have possession or control of all fully-paid or excess margin securities held for the account of customers, and determine daily that it is in compliance with this requirement. The broker-dealer must also make periodic computations to*

<sup>9</sup> Division of Market Regulation: *Compliance Guide to the Registration and Regulation of Brokers and Dealers*, October 1998



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*determine how much money it is holding that is either customer money or obtained from the use of customer securities. If this amount exceeds the amount that it is owed by customers or by other broker-dealers relating to customer transactions, the broker-dealer must deposit the excess in a special reserve bank account for the exclusive benefit of customers. This rule thus prevents a broker-dealer from using customer funds to finance its business.” – S.E.C.*

Exhibit 6 shows the summarized and simplified balance sheet and associated Rule 15c3-3 computation as filed by MJK Clearing for the period of August 2000 – August 2001. The numbers represent average percentages of total assets over the period.

Showing the relationship between the firm’s balance sheet and Rule 15c3-3 computations makes it easier to understand the limitation of the procedure in capturing risks inherent in securities lending transactions.

It is important to note that the terms ‘credit’ and ‘debit’ are used from the perspective of the customer. Hence, liability items are entered as ‘credits’ and asset items as ‘debits’. To perform the computation, broker-dealers subtract the amount of money customers owe to them (**Aggregate Debit Items** -adjusted by 3%) from the amounts owed by the firm to their customers (**Total Credit Items**). The broker-dealer is required to hold at a minimum this exact amount (6.27% in MJK Clearing’s case) in a reserve bank account.

#### Exhibit 6

MJK Simplified Balancesheet			
Assets:		Liabilities:	
Securities borrowed- Non-customer	42.2%	Securities Loaned - non Customer	40.9%
Customer Margin Balances - Secured	36.8%	Customer Credits	33.6%
Cash Segregated	6.2%	Securities Loaned - Customer	10.5%
Securities borrowed- Customer	2.4%	Bank Loans - Firm Secured	4.7%
Secured Demand Notes	2.2%	Secured Demand Notes	2.2%
Securities and Short term investments	2.6%	Failed to Receive - non Customer	2.1%
Cash	1.8%	Drafts Payable	1.3%
All Other Assets	5.8%	Other	3.0%
<b>Total Assets</b>	<b>100.0%</b>	<b>Total Owner's Equity</b>	<b>1.7%</b>
		<b>Total Liabilities and Equity</b>	<b>100.0%</b>

Simplified Reserve Computation (Rule 15c3-3)			
Customer Debit Balances:		Customer Credit Balances:	
Debit Balances in Customer Accounts	34.9%	Free credit balances	31.8%
Securities Borrowed	2.4%	Customer funds payable or used as collateral	11.3%
Margin Required on Deposit	1.9%	Securities Fail to Receive	0.4%
Other Customer debits	0.4%	Other Customer credits	1.2%
<b>Aggregate debit items</b>	<b>39.6%</b>	<b>Total Credit Items</b>	<b>44.7%</b>
Less 3%	1.2%		
<b>Total 15c3-3 Debits</b>	<b>38.4%</b>		

RESERVE REQUIREMENTS	
Customer Credits - Customer Debits	6.27%
Amount in Reserve Bank	6.47%



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Noticeably, non-customer securities borrowed/loaned items (shaded), which in the case of MJK Clearing represented the single largest balance sheet exposures (42.2 and 40.9%, respectively), are left out of the 15c3-3 computation.

As all Native Nations related securities borrowing activities were included in the non-customer related balance sheet items, there was no possibility for MJK Clearing's regulators to detect the risks inherent in the stock lending activities base on Rule 15c3-3 filings.

### Net Capital Computation (Rule 15c3-1)

*"The purpose of this rule is to require broker-dealers to have at all times enough liquid assets to promptly satisfy the claims of customers if the broker-dealer goes out of business."* – S.E.C.

There are two distinct ways to satisfy the net capital requirements, the *basic approach* and the *alternative approach*. MJK Clearing used the alternative method, which is the preferred methodology for most medium to larger sized securities firms.

The computation is relatively straightforward. Total **Capital & Allowables** are comprised of equity and subordinated debt. From this amount, deductions are made for illiquid and unsecured assets and haircuts have to be applied to the securities owned by the firm. Haircuts vary based on the type and credit rating of the security.

On average, MJK Clearing's net capital was well above the minimally required 2% of aggregate customer debits (from 15c3-3). However, in order to avoid increased regulatory scrutiny, securities firms are supposed to hold net capital in excess of 5% of aggregate debit items.

For the period covered (August 2000 – August 2001), on average, MJK Clearing held amounts that were 0.5% higher than the minimum net capital necessary to avoid regulatory scrutiny.

#### Exhibit 7

NET CAPITAL COMPUTATION	
Total Ownership Equity	1.7%
Secured Demand Notes (Subordinated)	2.2%
<b>Total Capital &amp; Allowables</b>	<b>3.9%</b>
Total Deductions and Charges	-1.3%
Total Haircuts	-0.2%
<b>Total Net Capital</b>	<b>2.51%</b>

Alternative Net Capital Computation (15c3-1)	
<b>Net Capital Requirement</b> (2% of Agg Debits from Reserve Computation)	<b>0.8%</b>
Excess Net Capital	1.7%
<b>Net Capital in Excess of 5%</b>	<b>0.5%</b>



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Arguably, MJK Clearing's FOCUS report filings included inaccurate financial information once the mark-to-market discrepancies from the Imperial bonds commenced. As MJK Clearing took no action or was unsuccessful at collecting payments from Native Nations, the miss-marked portion of the exposure represented an unsecured exposure.

Had MJK Clearing followed proper accounting rules, net capital would have declined sharply. The unsecured position would have been included in the item **Total Deduction and Charges** (Exhibit 8). In this case, the 5% requirement would have no longer been fulfilled, and according to rule 17a-11, the company would have been required to notify its examining SRO and the SEC of the deficiency. Under this scenario, the risks inherent in the firm's securities lending portfolio would have been discovered earlier.

#### Exhibit 8

MJK Clearing - NET CAPITAL COMPUTATION July 2001		
	As filed	Accurate
Total Ownership Equity	9,696,237	9,696,237
Secured Demand Notes (Subordinated)	16,900,000	16,900,000
<b>Total Capital &amp; Allowables</b>	<b>26,596,237</b>	<b>26,596,237</b>
Total Deductions and Charges	5,339,381	14,369,381
Total Haircuts	63,169	63,169
<b>Total Net Capital</b>	<b>21,193,687</b>	<b>12,163,687</b>

Alternative Net Capital Computation (15c3-1)		
<b>Net Capital Requirement</b> (2% of Agg Debits from Reserve Computation)	6,486,045	6,486,045
<b>Excess Net Capital</b>	<b>14,707,642</b>	<b>5,677,642</b>
<b>Net Capital in Excess of 5%</b>	<b>4,987,575</b>	<b>(4,051,425)</b>

However, it is of crucial importance to mention that while the Net Capital computation might have uncovered discrepancies in the transactions involving Imperial bonds, the same is not true for the GENI transactions. In that case, the value of the collateral dropped too quickly and losses exceeding the total capital of the firm accumulated in a matter of days.

#### Effectiveness of the Regulatory Rules

While Rules 15c3-3 and 15c3-1 are effective in capturing financial conditions for certain purposes, they are unsuited to uncover problems associated with large, non-customer related lending positions.

In the case of MJK Clearing, regulators received no disclosures revealing the risks associated with over 40% of the firm's total assets. To address these shortcomings, regulators need to obtain information or monitor through examinations levels of *counterparty credit risk, quality and liquidity of the collateral*, and perhaps most importantly, *concentration risk*.

The size of the lending exposure by itself (or as a percentage of capital) is not a significant factor. Risks associated with two lending portfolios of identical size can be vastly different. On the one extreme, it could consist of concentrated 'toxic waste' as in the case of MJK Clearing. On the other end of the risk spectrum, a portfolio of equal size could consist of many small exposures to highly-rated counterparties, involving government securities as collateral.



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Based on current filing requirements, regulators cannot make a distinction between these two exposures.

### **Improving Regulatory Reporting**

The 1999 CRMPG report contains a promising framework and specific suggestions how regulatory reporting can be improved. Specifically, the document suggests a regulatory report with a list of a firm's 10 largest counterparty exposures. This list would contain information along four dimensions:

- Gross exposure (net of collateral)
- Current replacement cost (measured at market)
- Current liquidation exposure, using liquidation values rather than market values
- Potential exposure of OTC derivatives

Had MJK Clearing been required to file a report containing this information, regulators would have undoubtedly discovered the disproportionate exposure to Native Nations.

## **5.4 Comparison of Risk Management Practices and Regulatory Capital Frameworks**

The risk management principles guiding US securities firms are distinctly different from the regulation of banks or securities firms in other jurisdictions, as reflected in Table C. While bank regulators' main concern is the solvency of the institutions, the major issue for securities regulators is the protection of customer assets.

**Table C**

<b>Area</b>	<b>US Securities Industry</b>	<b>Banks / European Securities Industry</b>
<b><i>Capital regulation approach</i></b>	▪ Net capital (US, Canada, Japan)	▪ Risk-based capital (e.g., BIS)
<b><i>Regulator's core principles (IOSCO/BIS)</i></b>	1) The protection of investors 2) Ensuring that markets are fair, efficient and transparent 3) Reduction of systemic risk	▪ '... to insure that banks operate in a safe and sound manner and hold capital reserves sufficient to support the risks that arise in their business'
<b><i>Main risk management focus</i></b>	▪ Market and liquidity risk	▪ Credit risk
<b><i>Core exposures</i></b>	▪ Security portfolios	▪ Loans and other credit exposures





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<i>Cushion in case of losses</i>	▪ Capital	▪ Provisions and loss reserves
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Risk based capital rules are specifically designed to address the risk factors involved in lending transactions. Under a banking regulatory framework, several limits and charges would have prevented MJK Clearing's disproportionate exposures to Native Nations. Under Federal Reserve banking rules, maximum allowable exposure to a single-borrower is equal to 15% of a bank's capital. In this case, MJK Clearing's maximum allowable exposure to *Native Nations* would have been under \$4MM, rather than the \$209MM actually carried on MJK Clearing's books. This amount might have been increased in the case of certain collateralized transactions. However, the type of risky collateral pledged by Native Nations would not have been recognized as a valid guarantee.

Table D shows how the various risk factors are treated for regulatory purposes:

**Table D**

<b>Risk factor</b>	<b>US Securities Industry</b>	<b>Banks</b> <i>(New BIS Standardized approach)</i>
<i>Counterparty risk</i>	Not addressed	Capital charge
<i>Concentration risk</i>	Not addressed	Strict limits apply (15% of capital for US banks)
<i>Collateral market risk</i>	Not addressed	Equities must be included in a major index
<i>Collateral liquidity risk</i>	Not addressed	Equities must be included in a major index
<i>Correlation between counterparty and collateral</i>	Not addressed	Must be addressed by banks

The net capital approach as applied by US regulator fails to address the risk factors inherent in dealer-to-dealer transactions. There are various relatively simple solutions to incorporate these important risk factors, as evidenced by rules proposed by the CRMPG or as currently practiced by banking regulators.



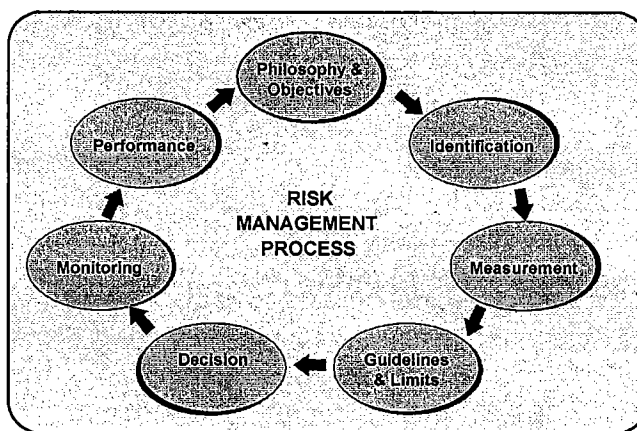
## 6 SIPC's Risk Management Function

The basic principles for the management of risks have evolved over the past several years as firms have improved their data collection efforts and refined their methodologies. An increasing number of SIPC member firms are using sophisticated risk measurement techniques to help enhance operational strategies, pricing methodologies, economic capital policy and measures of financial performance. Similarly, the fundamental concepts of Enterprise Risk Management ("ERM") can be used to identify and measure the risks faced by SIPC itself, as required for Study II of FitchRisk's assignment. This section of the report focuses on the application of an ERM process to the specific activities and objectives of SIPC as they relate to the management of the fund.

### 6.1 The Major Objectives of Enterprise Risk Management (ERM)

Companies are exposed to a universe of risks that impact their financial performance. ERM is the process for the identification, prioritization, measurement and mitigation of these risks across the entire firm. A well-designed ERM infrastructure equips company management with the decision tools needed to make value-enhancing decisions in the face of uncertain outcomes. As such, the ultimate goal of an ERM process is to meet or exceed corporate strategy objectives and to enhance shareholder value. Before implementing an ERM framework, the *Philosophy and Objectives* of the process need to be specified to ensure that the subsequent tasks are consistent with the company's overall goals. ERM is a dynamic process and subject to continuous changes and improvements, as described in Exhibit 9.

Exhibit 9



The ERM process comprises several components, forming a continuous loop to ensure that the major objectives of the process are frequently revisited and updated as experience is gained from the execution of all the steps in the risk management process.



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Broadly defined, the major objective of risk management is to develop a sound understanding of the uncertainties that impact the value of a firm and utilize this information to make decisions that enhance the value of the firm. Specifically, ERM techniques are used to translate the uncertainties associated with a firm's credit, market, and operational risks into the firm's exposure to these risks and, ultimately, to the financial performance of the firm. In order to capture SIPC's entire risk profile, it is helpful to categorize the risks into the following major categories:

- **Reserve Fund Risks** - Risks directly impacting the solvency of the SIPC fund
- **Operational Risks** - Risks associated with SIPC's operational activities
- **Interest Rate Risks** - Market and credit risks associated with the investment of the reserve fund assets

### **Reserve Fund Risks**

The steps described in this section correspond to the *Identification* and *Measurement* tasks of the ERM process illustrated in Exhibit 9. These steps serve as the basis for the subsequent tasks required to advance the ERM process.

- **Identify SIPC's major risk factors** - Risk factors refer to the different sources of uncertainties that affect a firm's inputs, production processes, or outputs. During the normal course of business, firms are exposed to numerous different risk sources. However, through the process of risk identification and prioritization, a firm can identify a subset of these risk factors that present the main threats to a company's financial performance. Measuring the impact of these material risk factors is the main objective of ERM. For SIPC, this is a "pure" risk that is not directly correlated with general market factors. Rather, SIPC is exposed to a loss resulting from the combination of market, credit and operational uncertainties that are faced by its member firms.
- **Identify SIPC's major risk exposures** - Risk exposure represents the potential value that can be impacted by the given risk factors. From SIPC's perspective, the maximum risk exposure is limited to the value of total customer assets of a failing member firm (with default forced by a credit event or some other event that forces a violation of minimum regulatory requirements). For SIPC, risk exposures are considered on a gross basis (i.e., based on actual maximum value subject to risk), as there is no existing mechanism in place for reducing the exposures through risk transfer agreements, hedging, or netting agreements.
- **Describe the potential impact associated with the risk factors and exposures on SIPC's financial position** - Having identified a firm's key risk factors and the exposures that are impacted by these risk factors, the next challenge relates to the



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expression of these risks relative to SIPC's financial position. Specifically SIPC will want to know how these factors can potentially affect the size of the fund. In order to accomplish this translation, a metrics and an analytical approach have to be specified to address SIPC's main objectives. For instance, risk systems designed to measure the impact of risk on firm capital over a 1-year horizon may differ from risk systems designed to measure changes in the market value of a firm over a 1-month period. Before a risk measurement approach can be finalized, the firm has to clearly define the main goals of its risk analysis process in order to ensure that the approach delivers the information necessary to make the required / desired decisions.

### **Operational Risks**

SIPC, like all firms, assumes operational risks through its activities. Operational risk has been defined in the financial sector as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. Operational risks arise from such general areas as:

- **Internal and external fraud** – Unauthorized activities, misappropriation of assets, and theft through penetration into systems security
- **Damage to Physical Assets** – Disasters and other events that impact physical assets
- **Systems Failures** – Disruptions and loss of information/data due to failures of hardware and software
- **Employment Practices and Workplace Safety** – Internal theft and fraud, safe environment, diversity and discrimination
- **Process** – Monitoring, maintenance of information, and reporting

Specifically for SIPC, examples of the potential operational risk causes include: the firm's ability to control costs related to liquidation events, the financial planning and accounting processes, and the management of employees.

From a prioritization perspective, the expectation of operational risk affecting SIPC in a catastrophic manner is significantly lower than the firm's exposure to its risks associated with the liquidation of member firms. For SIPC, operational risk can be managed more efficiently through the existence of a strong operational control infrastructure and the use of risk mitigation, rather than the reserving of risk capital.

### **Interest Rate Risks**

Through the investment of its reserve fund assets, SIPC assumes significant interest rate risks. However, as SIPC's current investments are limited to cash and U.S. Government securities, the risk exposure is mostly driven by the duration of the investments. SIPC's objective is to balance the need for a steady income source with the risks assumed due to longer-term investments. SIPC should ensure that its asset-liability management strategy is clearly communicated to all relevant parties.



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## 6.2 SIPC's Risk Management vis-à-vis its Mandate

SIPC's mandate as a protector of customer assets is similar to the role assumed by the Federal Deposit Insurance Corporation (FDIC) in the banking sector. However, the manner in which the two entities fulfill their respective roles is vastly different. The comparison between SIPC and the FDIC serves as a precursor to developing an appropriate risk infrastructure for SIPC:

- **Size of Organizations:** The contrast between the two organizations becomes apparent when comparing the relative size of their resources. The FDIC had a staff of nearly 6,500 at year-end of 2000, compared to SIPC's 31 fulltime employees.
- **Coverage:** SIPC does not provide the same blanket coverage as the FDIC. As securities markets are inherently risky, SIPC does not provide coverage against losses incurred by investors as a result of investing activities. Rather, SIPC replaces investors' missing funds and securities in situations where a member firm's liquid assets are insufficient to satisfy all customer claims (up to the pre-defined dollar limits) following a liquidation procedure. By contrast, the FDIC replaces the nominal value of all customer deposit assets (up to a limit of \$100,000 per customer), as deposits are not assumed to be risky assets during the normal course of the banking business.
- **Regulatory Role:** Unlike the FDIC in the banking sector, SIPC has no regulatory authority in the securities industry. SIPC is by statue prohibited from directly examining member firms.

More specifically, SIPC is relatively limited in its ability to perform effectively the three main risk management tasks that are commonly applied to providers of financial guarantees:

### Controls

SIPC has no control over the composition of its member base. Securities firms registered as brokers or dealers with the SEC under the Securities Exchange Act automatically obtain SIPC membership. SIPC has no authority to decline or withdraw coverage for firms on its own initiative as long as they contribute their annual member dues. Additionally, SIPC has no authority to directly control the activities of its member firms.

### Monitoring

By statue, SIPC has access to all the data securities firms are required to submit to the SROs and the SEC. However, SIPC has only limited resources to process and analyze vast amounts of securities industry data. Furthermore, given its mandate, SIPC is prohibited from taking proactive steps directly even if it detects a potential problem with a member firm.

### Risk-based pricing

SIPC's board has the authority to change its membership fees if deemed appropriate. However, introducing a tiered fee schedule based on the perceived risk posed by different member firms might be problematic in practice for two reasons. First, in order to determine



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the fee levels for individual firms, SIPC would have to assess the creditworthiness of its members. This would require significant resources, resulting in a costly exercise without clear benefits. Secondly, firms deemed to be risky by SIPC might experience significant stress as a result of this conclusion. This could accelerate the failure of those firms, a result contrary to the Corporation's overall mission.

**In conclusion, it is our view that SIPC is not in a position to effectively perform risk management tasks that are fundamental to its mission, without the support of the SEC and SROs. Even if SIPC's mandate were to be modified and resources added, the duplication of the efforts of the SEC and SRO would not necessarily lead to increased stability or enhanced value for SIPC or the securities industry in general. Consequently, we believe that SIPC must leverage the risk management functions of the SEC and SROs to manage its overall exposures. As part of this arrangement, SIPC should petition the SEC to enforce improved disclosure requirements and to implement expanded examination requirements. Additionally, in order to protect SIPC's position, the SEC and SROs should take immediate action against firms that display extremely unfavorable risk characteristics.**

### **6.3 Assessment of the Current Framework**

Overall, SIPC enjoys a productive working relationship with the SEC and the SROs. In many cases, the cooperation between the entities has yielded positive results. This is especially true in situations where mutual interests overlap. For instance, SIPC, the SEC and the SROs coordinated their activities to crack down on fraudulent penny stock schemes. Similarly, SIPC successfully lobbied the SEC Division of Market Regulation to increase net capital requirements for introducing brokers. However, in other cases, the priorities of the objectives of the regulatory entities differ from SIPC's top priorities.

The SROs supply SIPC with warning information that contains the names of potentially troubled member firms. The NYSE presents a warning list on a monthly basis while the NASD supplies similar notification on a case-by-case basis. This information enables SIPC to conduct preliminary research to prepare for emerging problem situations. Besides the warning information, the regulators submit only limited amounts of information to SIPC on a regular basis.

In summary, the relationship between SIPC and the regulators is well grounded and there exists willingness to cooperate by all parties. However, given the limited resources of the regulators themselves, SIPC's main priorities are not always shared by the regulatory entities.

### **6.4 Risk Management Structure Findings and Recommendations**

Given the current framework, SIPC is not in a position to independently manage and control the major risks that it faces. However, in an effort to better understand the dynamics that affect the adequacy of the SIPC fund, we recommend that SIPC develop a basic infrastructure to



support the formalized periodic analysis of the firm's main risk factors that impact the adequacy of the fund. The main benefits gained through such a process include:

- Improve SIPC's understanding of the main risk factors impacting the adequacy of the reserve fund
- A consistent framework for quantifying SIPC's risk exposures over time
- The ability to proactively identify and monitor major industry shifts and changes in risk drivers
- The capability to reassess risk exposure on an ad-hoc basis if warranted due to unusual market developments or uncommon loss events

Although the additional insight gained through the risk review process may be somewhat limited at the beginning, over time it will allow SIPC to compare present events with previously obtained analytical data. This will allow the Corporation to identify the most important data points and eventually to proactively identify threats of special concern.

The main purpose of the following four recommendations proposed by FitchRisk is to introduce a risk management mindset within SIPC. There exist two alternatives for the successful implementation of our recommendations, using internal or external resources. For the internal approach, FitchRisk believes that the incremental work load can be absorbed by one or two additional staff members. The additional staff members designated to the risk review process should have considerable experience in financial analyses and possess strong quantitative skills. Alternatively, considering its limited resources, SIPC could explore the possibility of outsourcing the suggested risk management tasks to a specialized third-party provider. Given the expected work load related to FitchRisk's recommendations, outsourcing may be a more cost effective solution compared to the costs associated with the employment of full-time staff. Regardless of whether this function is performed internally or by a third-party, it is crucial for the success of these recommendations that SIPC senior management is actively involved and that they are supported by the key regulatory agencies.

### ***Recommendation 1 - Establish a SIPC Risk Monitoring Team***

In order to successfully implement a risk review process, FitchRisk recommends that SIPC establish a Risk Monitoring Team. The Risk Monitoring Team would consist of 1 - 2 experienced financial analysts (internal approach) or a specialized third-party provider, supported by SIPC senior managers. The overall objectives and tasks to be performed by the Risk Monitoring Team should be formulated by the Board of Directors.

Initially, the Risk Monitoring Team will play a crucial role in the planning and design of the review process that is suggested by FitchRisk in Recommendation 2. After the initial implementation of the review process, the focus of the Risk Monitoring Team should include SIPC's risk management cooperation with regulatory agencies (Recommendation 3) and the



review and improvement of SIPC's secondary risk factors (non-member related risks) as formulated in Recommendation 4.

The Risk Monitoring Team will report its overall progress and analytical results and raise specific concerns with SIPC's Board of Directors on a frequent basis. It is crucial to note that the establishing of a Risk Monitoring Team does not represent a duplication of the efforts of the regulatory entities. Rather, the Risk Monitoring Team reviews the risks factors and major issues that are specific to SIPC.

### **Recommendation 2 – Enhanced Risk Monitoring Function**

To gain a better understanding of the key risk drivers of SIPC's risk exposure, we recommend the implementation of a comprehensive risk monitoring process. During the planning and implementation phase of a risk review process, the following points need to be addressed:

- **Specify data requirements** – The following type of data should be provided to SIPC by the SEC and the SROs periodically, in a standard template specified by SIPC. The data should be provided on an individual firm basis:
  - Income data
  - Customer and Non-Customer Assets by general asset classes (which need to be defined)
  - Counterparty information, including credit exposures and counterparty ratings for the largest exposures
  - Proprietary portfolio mix

The exact detail of the data sets depends on their current and future availability. Additionally, SIPC should specify a subset of all firms that captures all key risks in order to eliminate unnecessary work.

- **Develop a data collection process** – SIPC needs to develop a process that allows for the efficient collection of the data. This effort needs to be coordinated with the data providers, presumably the SEC and the major SROs. It is crucial that the obtained data is consistent and delivered in a standard format by the regulators at regular intervals.
- **Design a database** – In order to support the analytical framework of the risk review process, a user-friendly database needs to be developed. It is important to keep the design of the database flexible to accommodate future changes and additions to the data sets. For instance, scalability is important as well as the ability to interface with analytical models (e.g. via Excel)
- **Develop and implement a quantification process** - SIPC will need to design and develop an analytically consistent risk quantification approach that measures the impact of major risk factors to SIPC's overall risk profile. Careful consideration should be given to the various options that are available to SIPC as this step represents the most





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challenging task of the planning and implementation process. The main purpose is to create a standard measurement approach that leverages past work and serves as the basis for future enhancements.

- **Design reporting packages** – SIPC should design reporting packages that address the specific requirements of its key recipients such as senior management or the Board of Directors. Detailed records of all work performed should be kept within SIPC.
- **Formalize review of loss cases** – Identify and capture trends, successes in reducing brokerage failures and other relevant observations related to liquidation procedures.

Given that the risk analysis is conducted only on an annual basis, the efforts required should become more manageable after the first several times. Thus, the greatest resource requirement is for the collection and management of the database of member firm information.

### ***Recommendation 3 – Coordinated Review Examination***

In order to formalize the working relationship between SIPC and the SEC in the area of risk management, we suggest establishing a review process that involves key staff from both organizations. During periodic meetings, SIPC will have the opportunity to present the results derived from its annual risk monitoring process and provide observations and concerns to the SEC (and the SROs if appropriate). As part of this process SIPC will be able to call for additional disclosures by securities firms if deemed necessary and helpful for the improvement of the risk review process. Based on their cooperative efforts, SIPC and the SEC should develop a joint watch list identifying high risk members.

Parallel to the review process, we recommend that SIPC initiate a co-training program between SIPC and the SEC's examination teams to enhance the understanding of SIPC's objectives. As part of this program, it may be beneficial for SIPC staff to participate in a series of firm examinations to gain insight into the activities of member firms.

### ***Recommendation 4 – Formalize Risk Policies, Procedures & Responsibilities***

In order to manage operational risks, interest rate risks and other potential sources of risk within SIPC, the Corporation should ensure that a formal process exists for the identification, control and review of these risk factors. This would begin with a qualitative exercise to identify the key business activities and underlying operational risk causes and to assess the robustness of the associated controls, procedures and accountabilities. Specific areas of improvement in the framework should be identified, with improvement targets established and tracked over time. Also, the risk and control infrastructure should be fully documented and approved by the SIPC board, with an annual review and update. Finally, to ensure the ongoing effectiveness of the control infrastructure, a formal process should exist for the capture, documentation and review of losses incurred outside of the standard firm liquidation procedures. Any deficiencies in the framework should be noted, and an improvement strategy developed.



## 7 Risk Quantification

### 7.1 Introduction to the Quantification Methodology

In the selection of our modeling approach, we focused on developing a framework that is consistent with SIPC's economic role. Additionally, we sought to apply a methodology that permits to evaluate overall risk exposure and risks specifically associated with members' securities lending activities. The selection of a specific methodology is generally driven by the main objectives of the analysis, data availability and the factors that need to be included as part of the analysis. In the case of SIPC, the following considerations had to be included:

- SIPC's overall risk exposure is an aggregate of the individual risks contributed by its member firms.
- Historically, most of SIPC losses can be attributed to operational risk events such as mismanagement, theft and unauthorized trading.
- Although SIPC's past loss experience has not been negatively impacted by market turmoil, the possibility of severe market disruptions or fundamental industry shifts have to be included.

SIPC's involvement is generally required only when the value of a member firm's equity drops below zero. In order to estimate SIPC's risk exposure, the probability that a firm's equity drops below zero needs to be derived. For this purpose, FitchRisk applied an Option Theoretic Approach, which expresses the different stakes in a firm's capital structure in the form of option holdings. Using an option theoretic approach, equity can be expressed as a call option on a firm's assets. This is true because holders of equity enjoy the potential for unlimited upside if the assets of a firm appreciate. However, if the value of the aggregate assets drops below the value of total liabilities, they receive zero. These payout characteristics are equal to those of a call option. The details and the mathematical concept of the option theoretic approach are explained in the following sections.

### 7.2 Quantification Approach to Analyze SIPC's Risk Exposure

#### Introduction

The modeling framework implemented was developed to analyze SIPC's aggregate risk exposure, as well as the risk attributable to SIPC member's securities lending/borrowing activities. Risk measurement techniques are used to analyze the aggregate risk profile as the combination of 'expected' and 'unexpected' loss components. The 'expected' risk component represents the 'non-extreme', moderate part of an aggregate loss distribution that is consistent with the losses generated from small and medium size firms (as seen in the historic loss experience of SIPC). To capture the 'expected' loss component a standard modeling approach (lognormal) can be applied to determine the loss variability.



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Larger firms have not been represented in SIPC's historic loss distribution and embody a large portion of the unexpected losses to SIPC. Given the absence of reliable loss data to use in a conventional modeling setting, a more appropriate and descriptive modeling framework is developed for the analysis and modeling of extreme (unexpected) losses that represent the tail of a distribution. Empirical considerations of the following underlie this concept:

- Manifestation of isolated and very infrequent extreme loss events which indicate 'heavy' tail of statistical loss distribution
- Existence of dynamic risk component related to idiosyncratic market, credit and operational risk factors
- Capital markets exhibit highly unstable (in conventional senses) behavior with disproportional swings

Merton's framework has been selected as it is a well-accepted methodology to model the 'extreme' component of the portfolio loss distribution, and the absence of several critical data components made alternative models impractical. Specifically, we were unable to obtain the following data:

- Comprehensive operational industry loss data
- Publicly available credit ratings for a majority of member's firms
- Consistent benchmark analysis to represent the likelihood of default events.

For the unexpected component, the loss to SIPC then is defined as the equivalent of a call-spread option written on an underlying claims/loss process. The losses from the contract execution are represented by the following formula, applicable in case of a default:

$$L_i = \max[0, (\gamma_i A_{it} - \max(0, A_{it} - SD_i))] \quad (1)$$

where:

- $L_i$  = SIPC annual loss from the execution of  $i$ -contract
- $A_{it}$  = New value of the firm's assets
- $\gamma_i$  = Proportion of the firm's financial asset (customer assets) that SIPC covers in an event of a default
- $SD_i$  = Value of the firm's senior debt

In the Merton framework, a default is observed when the total value of a firm's assets declines below a pre-specified threshold level of total liabilities. To implement Merton's framework we represent the behavior of financial assets as a stochastic process. In general, asset dynamics are very complex to model as they depend on various factors, including the state of the economy, the changes in regulatory rules, operational and credit risk events, and the political environment. To consider all these factors we apply a procedure known as a Jump Diffusion Process (JDP). The JDP is the hybrid of two well-known statistical procedures – Geometric Brownian Motion



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(GBM) and the Discrete Poisson process. JDP often is used in credit risk quantification settings to describe the occurrence of sudden shock events. In order to analyze an annual distribution of SIPC's losses, we integrate the 'expected' and 'unexpected' risk components by running simulations using Monte Carlo techniques to generate a large number of hypothetical scenarios of SIPC's portfolio from the JDP.

## **Methodology**

### **Modeling the 'Expected Loss' Component**

We model the 'expected' risk component by applying standard actuarial techniques to decompose the aggregate loss distribution into loss frequency and severity components. For this purpose, we fit a discrete statistical distribution to SIPC historical loss experiences. A Negative Binomial distribution will be applied to model the annual occurrence (frequency) of losses. Subsequently, a lognormal distribution is fitted to the historical loss (severity) data to generate a continuous loss distribution.

In order to generate the aggregate loss distribution for the 'expected' component, we then apply a statistical compounding procedure on the frequency and severity distributions. The Monte Carlo technique is implemented to generate annual losses, with a controlling mechanism to stabilize the tail area of distribution.

### **Modeling the 'Unexpected-Loss' Component**

The firms that comprise the unexpected loss component are subject to various underlying risk factors. These include the loss in value that may arise from the change in the market value of assets, losses from credit exposures to counterparties in such activities as securities lending, and operational risk events related to the activities of the firm. To describe an accurate and dynamic risk profile from these firms, each element is explicitly modeled in our approach.

Within Merton's general framework, we implemented a statistical decomposition technique by separating the "smooth" component of a stochastic process from the "jump" component. The smooth component represents the performance of firms' financial assets under normal circumstances. This condition reflects the state of the economy without extreme stress in an environment where firms operate under normal conditions, with well-established risk management procedures. Mathematically, the smoothing component is represented by a GBM with a constant drift.

The second component, the Jump Diffusion Process, is applied to describe unusual shock events, outside of the normal scope experienced by an individual firm or the economy as a whole. A shock can be thought of as an operational risk event, as experienced in the case of MJK Clearing, Inc. The occurrence of a jump may lead to instantaneous changes in the value of a firm's assets. Finally, we model the risk associated with a credit default event for a large, single securities lending counterparty, by applying a Credit Jump Process technique.



Finally, we combine these two components into the Jump Diffusion Process that functions as the stochastic engine of our model. Mathematically, the JDP can be expressed as the following stochastic differential equation:

$$\frac{dA_1}{A_0} = \mu_{\text{firm}} dt + \sigma_{\text{firm}} dZ + \kappa dq_1 + \omega dq_2 \quad (2)$$

where:

- $\frac{dA_1}{A_0}$  - Rate of change in total assets from time  $t = 0$  to  $t = 1$ ;
- $\mu_{\text{firm}}$  - Average of rate of change in firm's overall assets (constant drift);
- $dt$  - Time increment;
- $\sigma_{\text{firm}}$  - Volatility of rate of change of firm's overall assets;
- $dZ$  - A Wiener process to describe the GBM
- $\kappa$  - Annualized proportional jump size attributed to operational risk, which is random and determined by the natural logarithm of the jumps being normally distributed with  $\kappa_1$  as the average jump size and  $v_1$  as jump volatility ;
- $dq_1$  - A discrete Poisson process to represent annualized frequency of operational risk jumps;
- $\omega$  - Annualized proportional jump size attributed to credit risk, which is random and determined by natural logarithm of the jumps being normally distributed with  $\omega_1$  as the average jump size and  $v_2$  as jump volatility ;
- $dq_2$  - A discrete Poisson process to represent annualized frequency of credit risk jumps;

In order to properly reflect losses attributable to credit events, we apply  $\omega dq_2$  of the stochastic differential equation to  $A_0$ .  $A_0$  represents total assets at  $t = 0$  less security borrows.  $\mu_{\text{firm}}$  and  $\sigma_{\text{firm}}$  represent parameters of the smooth component of the stochastic process, whereas  $\kappa$ ,  $\omega$  and  $dq_i$  describe the Jump Processes. We model annualized proportional jump sizes,  $\kappa$  and  $\omega$  as a random variables determined by natural logarithm of the jumps sizes being normally distributed with  $\kappa_1$  and  $\omega_1$  as the average jump sizes and  $v_i$  as jump volatilities.

We simulate the total value of firms' assets at  $t = 1$  by using the asset dynamic model. According to Merton's methodology default event is observed when total assets at  $t = 1$  fall below the pre-specified threshold. We set the value of this threshold equals to total liabilities multiplied by the threshold coefficient. If there is a default event observed, we determine total losses to SIPC as the sum of losses represented by Equation (1).



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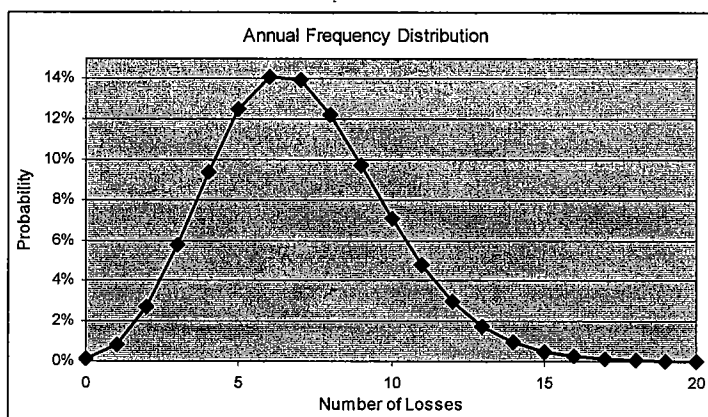


## Parameter Estimation and Model Calibration

### 'Expected Loss' Parameters

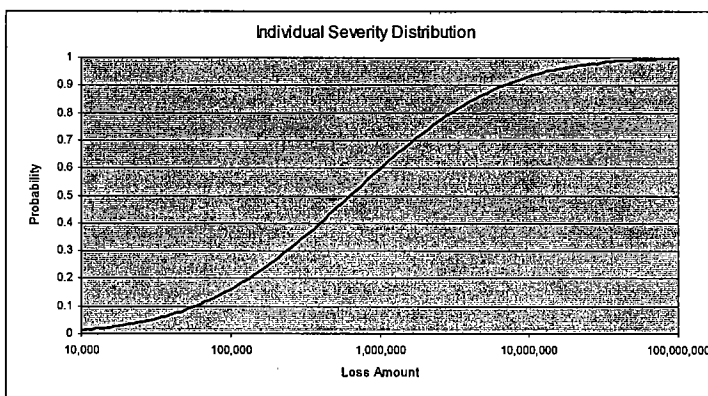
As described above, we begin by fitting a discrete statistical distribution to SIPC's historical loss experience from 1975 to 2001 (losses before 1975 are not included due to the regime shift in customer protection created by SIPC's formation). The parameters of the Negative Binomial distribution applied to model the annual occurrence (frequency) of losses are:  $r = 49.52$  and  $\beta = 0.14$ . These parameters generate a discrete distribution with an annual mean = 7.04 and variance = 8.04.

Exhibit 10



The lognormal distribution used to model the historical loss severity also is based on data from 1975 to 2001, with parameters  $\mu = 3.36$  and  $\sigma = 1.86$ . These parameters generate continuous loss distribution with mean = 3.55 M and CV (coefficient of variation) = 5.5.

Exhibit 11



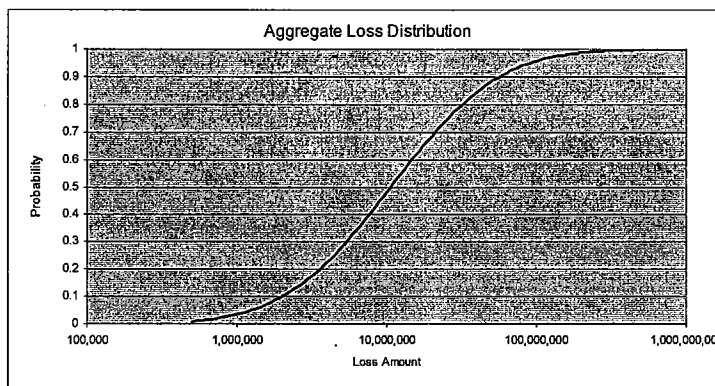
The parameters used in the statistical compounding procedure on the frequency and severity distributions were estimated as mean = 25 M and CV = 2.11.



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**Exhibit 12**



**'Unexpected Loss' Parameters**

In order to model the volatility of a firm and to make the model computationally feasible, we grouped the assets of SIPC member firms in six different categories. These categories were selected according to liquidity and volatility characteristics of the various assets. As there is significant interdependence between various asset categories, we obtained correlation coefficients to express the relationship between these different asset classes, shown in Exhibit 13.

**Exhibit 13**

Asset Correlation						
	A1	A2	A3	A4	A5	A6
<b>A1: Cash and Cash Equivalents</b>	100%	98%	11%	-4%	-14%	50%
<b>A2: Gvt Securities &amp; Secured Receivables</b>	98%	100%	14%	-9%	-2%	48%
<b>A3: Corp Bonds &amp; Unsecured Receivables</b>	11%	14%	100%	26%	-2%	-17%
<b>A4: Equity</b>	-4%	-9%	26%	100%	84%	-5%
<b>A5: Volatile/Illiquid Assets</b>	-14%	-2%	-2%	84%	100%	-3%
<b>A6: Non-Stochastic Assets</b>	50%	48%	-17%	-5%	-3%	100%

Source: Ibbotson Associates

In order to model the behavior of the different asset classes, we obtained their historical means and volatilities as shown in Exhibit 14 below. Through the use of simulation techniques the potential value range of the six assets classes can be estimated.

**Exhibit 14**

Asset Return Parameters						
Parameter	A1	A2	A3	A4	A5	A6
<b>Asset Mean</b>	4.48%	4.85%	7.80%	7.45%	4.42%	0.00%
<b>Asset Volatility</b>	0.4%	2.5%	6.6%	17.6%	23.6%	3.07%

Source: Ibbotson Associates



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In order to introduce the possibility of operational risk events, we introduced a JDP as described in the previous section. The parameters shown in Exhibit 15 below represent the frequency (probability of jumps), severity (jump mean) and magnitude (jump volatility) of the jumps. These parameters are based on Fitch Risk Management's proprietary operational risk database and experience from past operational risk projects.

**Exhibit 15**

Operational Risk Jump Parameters	
Probability of Jump	0.2%
Jump Mean	(2.5)
Jump Volatility	30%

To estimate the risks specifically associated with securities lending/borrowing activities, the portfolio mix underlying these transactions had to be specified. The selected portfolio mix presented in Exhibit 16 is based on a periodical survey performed by the RMA.

**Exhibit 16**

	Weights
US Treasury	48.96%
US Equity	29.10%
US Corporate	10.36%
US Agencies	11.59%

By combining the portfolio weights in Exhibit 16 with the return and volatility parameters specified in Exhibit 14, we can obtain a single mean and standard deviation for the entire securities portfolio that is underlying securities borrowing/lending transactions, shown in Exhibit 17.

**Exhibit 17**

Sec. Borrow Return Parameters	
Security Borrows Mean	5.4%
Security Borrows Volatility	7.0%

### **Computed Parameters**

To calculate firm's total expected assets return and associated volatility, we used the following mathematical expression:

$$\mu_{firm} = \sum_i w_i r_i$$

where:





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- $w_i$  - Weight assigned to particular (i) asset class as a proportion to the total assets;
- $r_i$  - Rate of return on particular (i) asset class;

$$\sigma_{firm} = \sqrt{\sum_i \sum_j w_i w_j \sigma_i \sigma_j \rho_{ij}}$$

where:

- $w_i$  - Weight assigned to particular (i) asset class as a proportion to the total assets;
- $\sigma_i$  - Volatility of asset  $i$
- $\rho_{ij}$  - Correlation between asset classes;

Firm's asset rate of return ( $\mu_{firm}$ ) is computed by taking a weighted average of returns of each particular asset class. Firm's assets volatility ( $\sigma_{firm}$ ) is computed by taking the square root of sums of the weighted volatilities of assets and the correlation between asset classes.

### **Model Implementation**

The process of generating SIPC's aggregate loss distribution involves several steps:

#### ***Step 1***

In Step 1 we model the dynamic changes in total assets, reduced by portion of  $A'_0$  from  $t = 0$  ( $A_0$ ) to  $t = 1$  ( $A_1M$ ). First, we generate the smooth component of Equation (2) by simulating random numbers from lognormal distribution with mean of  $\mu_{firm}$  and volatility of  $\sigma_{firm}$ :

$$A_1M = A'_0 \phi_{market}$$

where:

- $A_1M$  - Value of total assets at  $t = 1$  reduced by security borrows at  $t = 0$  after the market event;
- $\phi_{market}$  - Annualized rate of return;

#### ***Step 2***

In this step, we generate the effect on the new total assets due to the credit risk event. First, we determine the probability of a default by simulating random numbers from a normal distribution with a mean of 1.2% and volatility of 0.12%. These are the historical default mean and volatility for BB (S&P) rated companies over one year horizon. Then we simulate default



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events by generating uniformly distributed random number and comparing them to the generated default probability. In case a default occurs, the amount of securities borrowed changes proportionately to a lognormally distributed random variable with the mean and volatility of the underlying securities borrowing portfolio. If the value of the securities borrowing portfolio at  $t = 0$  is higher or the same as the value of the same portfolio at  $t = 1$ , the total new value for this asset, including the credit event is expressed in the following formula:

$$A_1C = A_1M + SB_0$$

where:

- $A_1C$  - value of total assets at  $t = 1$  after the credit event;
- $SB_0$  - value of security borrows (as part of total assets) at  $t = 0$ ;

However, if the new securities borrowed amount is less than the amount of securities borrowed at  $t = 0$  then the new total asset value with the credit affect is as follows:

$$A_1C = A_1M + SB_0 - \Delta$$

where:

- $\Delta$  - the difference between market value of securities borrowed at time  $t = 0$  and  $t = 1$  multiplied by a counterparty coefficient;

### Step 3

In Step 3 we simulate an event of jump associated with operational risk by comparing a uniformly distributed random variable to the probability of jumps. Given we have a jump we simulate the size of jump from lognormal random variable with mean of  $\mu_{jump}$  and volatility of  $\sigma_{jump}$ . The result of Step 3 is the value of assets after an operational event at  $t = 1$  ( $A_1O$ ), as follows:

$$A_1O = A_1C(1 - \varphi_{jump})$$

where:

- $A_1O$  - Assets at  $t = 1$  after the operational event
- $\varphi_{jump}$  - Value simulated from lognormal random variable with mean of  $\mu_{jump}$  and volatility of  $\sigma_{jump}$



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#### Step 4

In Step 4 we identify an event of default by comparing the value of  $A_1O$  to the liability threshold. The condition of default is given by the following mathematical inequality:

$$A_1O \leq \theta LIB_i$$

where:

- $\theta$  - Industry-accepted liability loss coefficient;
- $LIB_{i1}$  - Total liability of the firm;

#### Step 5

Given a default event, we calculate annual SIPC's loss by applying formula (1), shown on Page 40 of this report. Using Monte Carlo simulation techniques, we generate sufficiently large samples of annual losses to reach a stability condition for the tail of the 'extreme' part of the distribution. Especially, we concentrate on stability at 99.9% level.

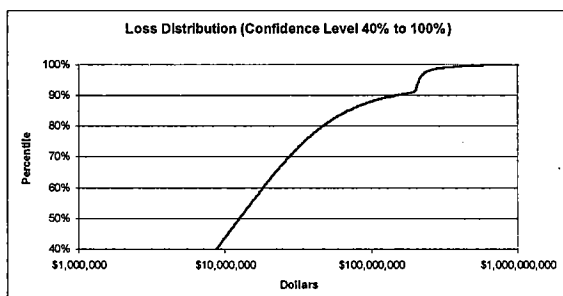
#### Step 6

Finally, we combine the two parts of the aggregate distribution to generate the total annual SIPC's loss distribution.

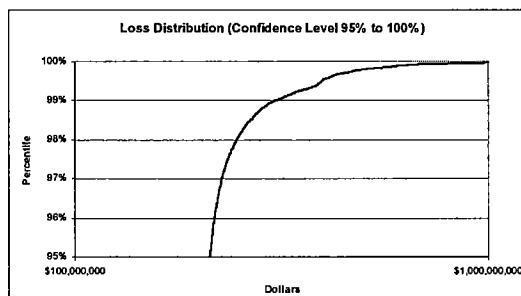
### 7.3 Analysis of SIPC's Aggregate Loss Distribution

Exhibits 18 and 19 represent the aggregate loss distribution starting with confidence levels of 40 and 95 percent, respectively. Visual analysis of the cumulative distribution reveals some characteristics that are typical for portfolios of contingency risks. The most noticeable feature is the bump that occurs at the far tail of the loss distribution. The observance of such a shape is consistent with the characteristics of SIPC's business portfolio. Due to the large size of many member firms, a single default of a larger institution can result in significant losses to SIPC.

**Exhibit 18**



**Exhibit 19**





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Numerically, the aggregate loss distribution is presented in Exhibit 20. Generally, risk managers are interested in the loss amounts observed at high probability levels. The probability that the entire SIPC fund, currently \$1.24 billion, is exhausted lies in the neighborhood between 0.02 – 0.04%, probabilities that are generally associated with catastrophic events. It is significant to note that from SIPC's perspective a loss in excess of \$500MM is expected to incur once in 100 years. Although this is a small probability, it presents a realistic number of the magnitude of losses SIPC should be prepared to handle during a difficult year.

**Exhibit 20**

Probability	SIPC's Aggregate Loss
99.99%	\$1,337 MM
99.95%	\$1,107 MM
99.90%	\$1,089 MM
99.50%	\$ 769 MM
99.00%	\$ 477 MM
95.00%	\$ 220 MM
90.00%	\$ 203 MM

Of further interest are the mean and standard deviation obtained from the aggregate loss distribution. The obtained mean of \$51MM represents the loss that SIPC should expect during the course of a 'normal' business year. This compares to average losses of approximately \$22MM (adjusted for inflation) that SIPC incurred from 1975 – 2001. This indicates that SIPC's 'normal' contingency risk has increase considerably compared to the past.

**Exhibit 21**

Mean	\$ 51 MM
St. Dev.	\$ 107 MM

### **Adequacy of the SIPC Fund**

Based on SIPC's current risk profile, we conclude that the size of the reserve fund of \$1.24 billion is sufficient at a 99% confidence interval. The probability that the fund will be exhausted within a one year period is small. Given that SIPC has access to additional liquidity in excess of \$2 billion in the event of a severe crisis, we believe that the total claims paying abilities are adequate to withstand an extremely severe stress case. At the same time, we encourage SIPC to take steps to better monitor and assess risks associated with its business portfolio (Section 5.4 - Recommendation 3). Based on our analysis, the risks associated with SIPC's member firms have increased in recent years and a further increase cannot be excluded. Additionally, should SIPC experience losses that are significantly above the mean of \$51MM over the next several years, an increase in member contributions should be considered. In conclusion, the adequacy of the SIPC fund remains sufficient.



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## 7.4 SIPC's Risk Exposure Related to Member's Securities Lending Activities

### *Risks in Securities Lending Transactions*

The risks involved in securities lending activities are similar to those in other secured lending transactions. Major categories include credit risk, market risk, liquidity risk and operational risk. The MJK Clearing, Inc. incident provides a concrete example as it contained elements of all of these risk categories. Specifically, we identified the presence of the following risks:

**Table E**

Risk Category	Detail
<b>Operational Risk</b>	<ul style="list-style-type: none"> <li>▪ Absence of any meaningful control procedures</li> <li>▪ Lack of exposure limits</li> <li>▪ Inappropriate mark-to-market processes</li> </ul>
<b>Credit Risk</b>	<ul style="list-style-type: none"> <li>▪ Exposure to a weak counterparty</li> <li>▪ Large concentration to a single borrower</li> </ul>
<b>Market Risk</b>	<ul style="list-style-type: none"> <li>▪ Adverse move in GENI shares and other assets following the default of Native Nations</li> </ul>
<b>Liquidity Risk</b>	<ul style="list-style-type: none"> <li>▪ Poor liquidity for several assets that needed to be liquidated (e.g. Imperial bonds)</li> </ul>

Several of the risks described in the table above are interrelated. For instance, the lack of a formal limit setting process (Operational Risk) permitted a very high exposure to Native Nations Securities, Inc. (Credit Risk). Similarly, market and liquidity risk are often closely related. In the event of a forced sale, illiquid securities are difficult to liquidate and often have to be sold at steep discounts.

Besides the MJK Clearing case, there are various other potential scenarios under which SIPC members (and SIPC by extension) could incur sizable losses due to securities lending exposures. These include:

- **Misuse of securities** – Borrowed securities could be speculatively sold short and a large loss could occur as the results of a sharp price increase.
- **Reinvestment of cash collateral** – Cash collateral is often reinvested in the fixed income markets for the expected duration of the transaction. A sharp change in interest rates could cause a problem if a lending transaction is recalled earlier than expected.
- **Settlement and legal risks** – These risks are relatively minor in domestic US securities lending transactions. However, cross border transactions could lead to disputes regarding applicable laws. Additionally, differences in setting procedures could potentially lead to problems with the exchange of cash and securities.



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Regardless of the other risk factors, careful counterparty assessment and diversification are paramount to avoid most of the risks that can lead to sizable losses from securities lending activities. Absent any legal disputes, transactions between two solvent parties can be terminated according to the terms of the loan agreement. This is true even in cases where the underlying securities have become impaired. Should a counterparty default occur despite a strict credit review process, a high level of diversification will limit the maximum amount of the potential loss.

A major challenge in estimating the overall hazards associated with securities lending is the enormous range of the potential risk characteristics of individual transactions. Exhibits 22 and 23 show the default probabilities associated with various credit ratings categories and the price volatilities for different securities categories. Major risks exist in exposures where counterparty default probabilities are high and the collateral exhibits high price fluctuations (e.g. high volatility). Historically, exposures to Investment Grade rated counterparties (BBB or better) have rarely caused problems. For Non-Investment Grade companies on the other hand, the default probabilities increases sharply with declining ratings. It is important to note that the default probabilities shown in Exhibit 22 are for illustration purposes only as they apply for the entire corporate ratings universe covered by Standard & Poor's and are not specific to the securities industry. Only about a dozen large SIPC member firms are rated by Nationally Recognized Statistical Rating Organizations ("NRSRO"), while the majority of SIPC members are not.

**Exhibit 22**

	<b>Rating</b>	<b>1 Year Default Probability* (%)</b>
<b>Investment Grade</b>	AAA	0.00
	AA	0.01
	A	0.05
	BBB	0.26
<b>Non-Investment Grade</b>	BB	1.22
	B	5.96
	CCC	24.72

**Exhibit 23**

<b>Securities Type</b>	<b>Daily Volatility*</b>	<b>Annualized Volatility*</b>
Government Securities (10 yr Tsy)	0.55%	8.87%
S&P 500 Index	1.37%	22.08%
Individual Large Cap securities	2.24%	36.12%
NASD 100 Index	3.09%	49.77%
NASD 100 Individual securities	4.56%	73.53%
Actively shorted NASDAQ securities**	5.63%	90.78%
*January - June 2002		
**Top 10 shorted securities		



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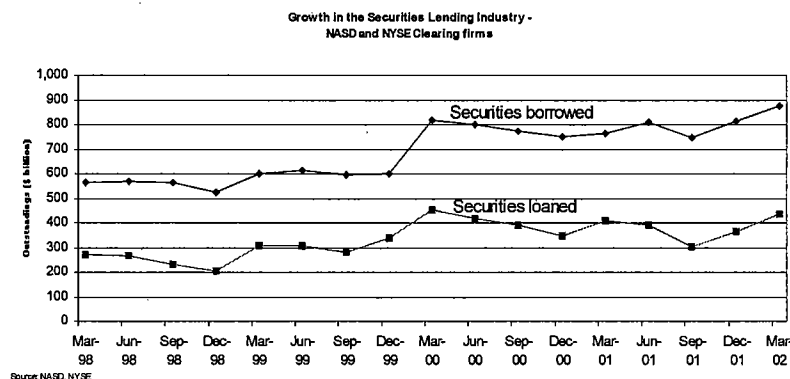
Price volatility of the underlying security is an important factor as it offers an estimate for the expected losses in case a security position needs to be liquidated. Annualized price volatility of 90.78%, as observed for actively shorted NASDAQ stocks, roughly translates into one adverse price move in excess of 6% per week. However, annualized volatility is a statistical measure derived from historical observations and does not accurately forecast the full range of future price moves. In extreme cases adverse price moves can be much higher, as experienced with GENI securities following the failure of Native Nations Securities, Inc. By contrast, collateral held in the form of US treasury securities offers adequate protection under most circumstances. Daily price moves in excess of 3% are extremely rare, even for longer dated treasury securities. Additionally, a competitive market exists for these securities at most times, which facilitates the liquidation procedure in case of a counterparty default.

### Securities Lending Exposures of SIPC Member Firms

Non-customer related securities lending activities by SIPC members have grown significantly in recent years. Measured in terms of total outstandings, securities borrowings have grown from less than \$600 billion to nearly \$900 billion over the past four years (Exhibit 24). Growth of securities lending exposures has been temporarily slowed by a declining overall stock market commencing in March 2000. However, as soon as capital markets recover, growth rates can be expected to return to previous levels.

Security borrowings are consistently higher than security loans for SIPC member firms. This can be explained by the active role assumed by institutional investors, primarily as lenders of securities.

**Exhibit 24**



As a percentage of total assets, aggregate securities lending activities have, remained largely unchanged for NYSE regulated firms. Exposures have consistently ranged between 26 – 32% of total assets over the past four years (Exhibit 25). NASD firms on the other hand, have nearly doubled their securities borrowing activities during this relatively short period.

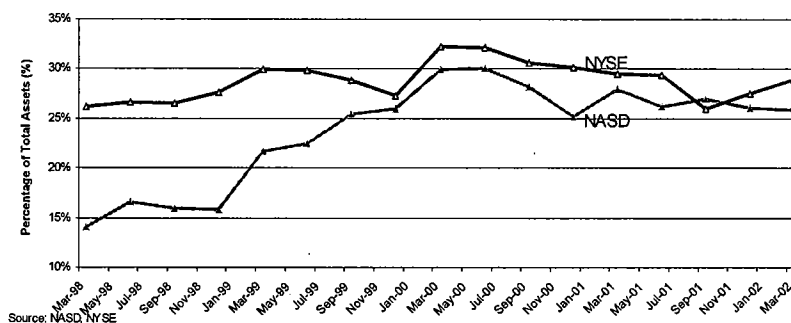


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### Exhibit 25

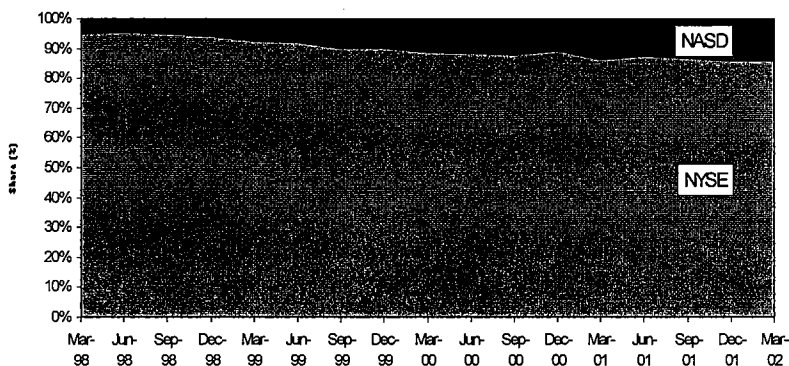
Growth of Securities Borrowed vs Total Assets  
NYSE vs. NASD firms



Combined, NYSE firms account for nearly 90% of the total exposure. However, the market share of NASD firms has grown considerably in recent years.

### Exhibit 26

Securities Borrowing/Lending Market Share NYSE vs NASD Firms



Among the 316 self-clearing NASD firms, a relatively small number is exposed to risks associated with non-customer related securities lending. A combined 29 firms carried securities lending exposures in excess of \$1MM as of March 2002 (Exhibit 27).

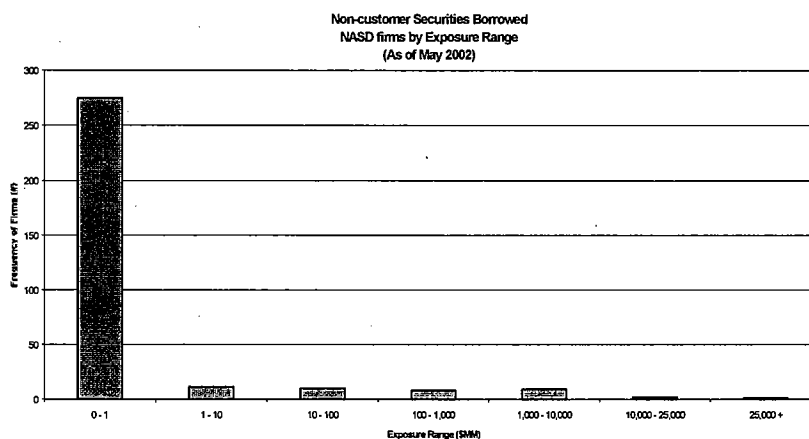




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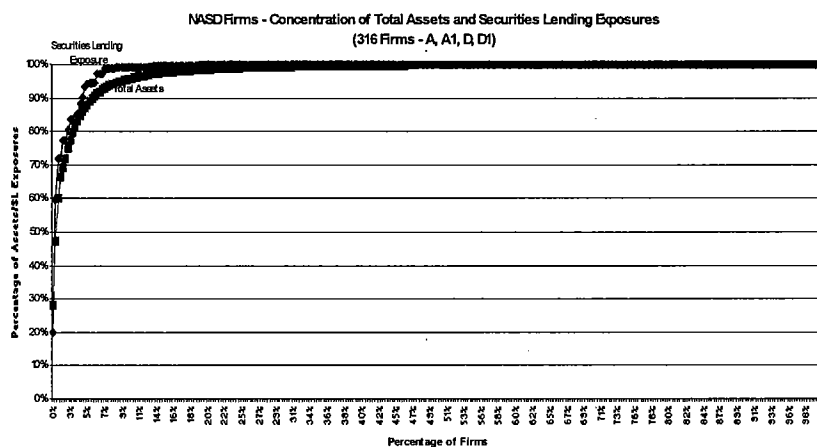


### Exhibit 27



As illustrated in Exhibit 28, fewer than 7% of self-clearing firms (22 firms) carry over 99% of the aggregate securities lending exposure of NASD regulated firms. Some of these firms share similar characteristics with MJK Clearing in regards to asset size, capitalization ratios and securities lending exposures.

### Exhibit 28



### Benchmarking MJK Clearing, Inc.

To gain a better understanding of the magnitude of the MJK Clearing incident in relation to the overall industry, we benchmarked the firm's securities lending exposure vis-à-vis its peers. This analysis was performed in order to explore the hypothesis that MJK Clearing represented a unique situation with extremely high leverage ratios.

As of June 2001, shortly before MJK Clearing Inc's collapse, a total of eight firms had higher securities lending exposures than MJK, as shown in Exhibit 29. Two firms exhibited



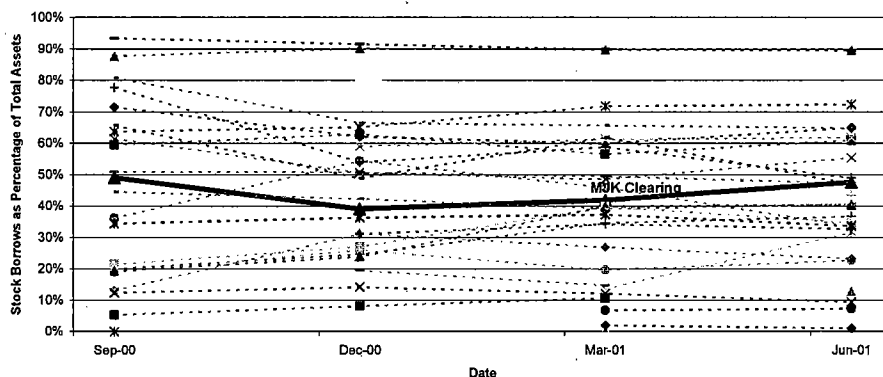
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extremely high exposures, in excess of 90% at some points. The total assets of these two firms amounted to approximately \$400MM and \$3 billion respectively.

### Exhibit 29

Benchmarking MJK Clearing, Inc.  
SECURITIES BORROWED - PERCENTAGE OF TOTAL ASSETS

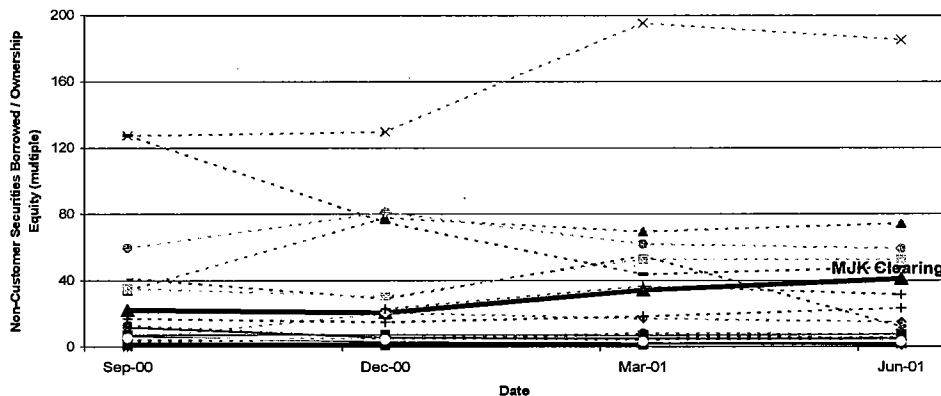


Source: NASD

Expressed as a multiple of ownership equity, a total of five firms had higher securities lending leverage than MJK Clearing Inc. MJK's securities borrowing multiple exceeded 40-times owner's equity in June of 2001, about three months before the firm's failure.

### Exhibit 30

Benchmarking MJK Clearing, Inc.  
SECURITIES BORROWED - MULTIPLE OF OWNERSHIP EQUITY



Source: NASD

Compared to its peers, MJK was relatively highly leveraged but not to a degree that the firm's activities attracted regulatory scrutiny. As mentioned earlier, leverage multiples are only a crude measure for the risks associated with a securities lending portfolio as risks associated with securities lending transactions vary widely. Based on this analysis, the hypothesis that MJK Clearing's exposure represented a unique situation remained unconfirmed.



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### **Securities Lending Risk Quantification**

As spelled out in previous sections, the most important risks factor in securities lending transactions are counterparty exposure and the price volatility of the underlying securities. As neither counterparty information nor underlying security portfolios are disclosed as part of the regulatory reporting process, we relied on alternative methodologies to estimate the risk contribution due to SIPC member's securities lending activities. To this end, we performed two separate but related analyses:

- 1) Comparison of earnings volatilities of SIPC firms with and without securities lending exposures.
- 2) Examination of firms overall risk contributions at different points in time within the previously described Merton framework.

Due to the restricted data availability for individual NYSE regulated firms, we were only able to perform these analyses for NASD firms. The obtained results are described in the following sections.

### **Comparing Earnings Volatilities**

Earnings volatility is a generally accepted measure of a firm's financial stability. Assuming that a company has reliable revenue sources and strict expense controls, earnings volatility should be relatively benign. As a general rule, larger firms tend to exhibit lower earnings volatility as they have a more established market presence and are more diversified than smaller firms. In order to eliminate distortions attributable to firms' different asset sizes, we divided them into 5 categories.

Exhibit 31 shows the average earnings volatilities of NASD firms as a percentage of total assets. Firms with securities lending exposures are plotted on the y-axis, compared to firms that do not have any securities lending portfolios that are graphed on the x-axis. Firms with assets of less than \$10MM were excluded, as there was only a single firm with meaningful securities lending exposures. Based on this analysis, it is inconclusive if securities lending activities impact firms' overall risk characteristics. While smaller firms with securities lending exposures (\$10MM - \$1Billion in total assets) display slightly higher earnings volatility, the opposite is true for larger firms.

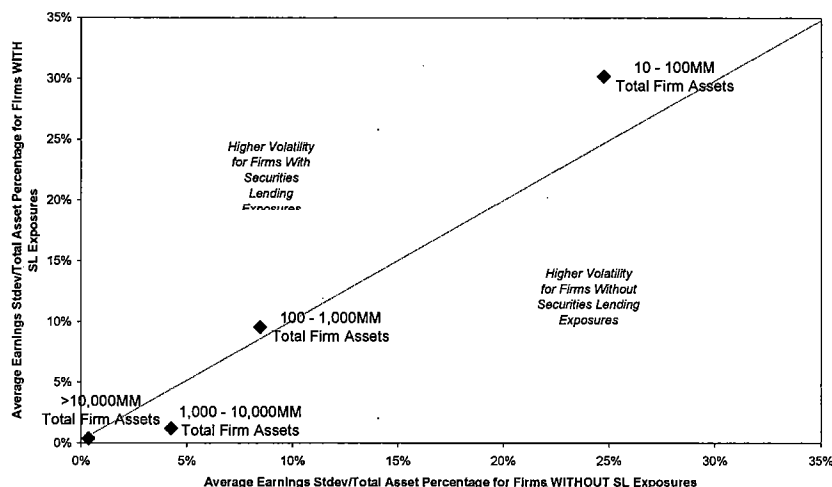


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### Exhibit 31

Comparison of Earnings Volatilities for  
Firms With and Without Securities Lending Exposures



### Isolate Change in Securities Lending Exposures

As an additional study, we attempted to approximate the risk effect of the growth in securities lending activities by isolating the risk contribution of members' securities borrow exposures. For this analysis, we utilized the simulation model of the expected and unexpected losses, as described in the section above. However, this analysis entailed eliminating the MJK event from the expected loss profile and re-simulating the loss profile for SIPC based on the securities borrow exposures for NASD firms in 1998, with all other aspects remaining constant. The form of the NYSE data prevented the inclusion of adjusted information for these firms. The examination also was severely limited by the lack of robust information on the change in the likelihood and severity for extreme operational risk events related specifically to stock lending activities.

Despite these challenges, a comparison of the aggregate loss distributions for the current portfolio of member firms versus the adjusted portfolio is presented in Exhibit 32. When comparing the tail of the distribution, we see that the capital requirements have moved from \$386MM to approximately \$476MM (99% confidence level).



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**Exhibit 32**

Probability	Adjusted Loss	Current Aggregate Loss
99.99%	\$1,142 MM	\$1,337 MM
99.95%	\$ 733 MM	\$1,107 MM
99.90%	\$ 662 MM	\$1,089 MM
99.50%	\$ 610 MM	\$ 769 MM
99.00%	\$ 389 MM	\$ 477 MM
95.00%	\$ 90 MM	\$ 220 MM
90.00%	\$ 56 MM	\$ 203 MM

Thus, it can be estimated that the riskiness of SIPC's business has increased as the securities borrow activities of NASD firms also have increased. However, it is important to understand that this value reveals more about the direction of the change in riskiness. The limitations of the analysis, from a data perspective, prevent the determination of the exact magnitude of the change.



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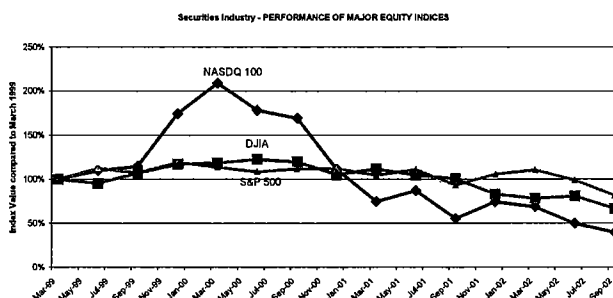
## 8 Appendices

### 8.1 Recent Changes in the Securities Industry

#### Overview

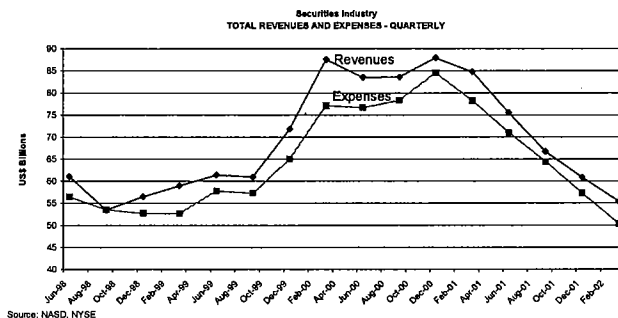
There exists a broad consensus that the overall risks inherent in the securities industry have increased sharply over the past two years. The unprecedented growth rates experienced during the 1990's have reversed sharply beginning in March of 2000, as shown in Exhibit 34. Since then, major market indices have dropped sharply, especially the NASDAQ 100 index which contains a disproportionate amount of telecom and technology securities.

**Exhibit 34**



As a result of the extended market downturn and the slowdown in economic growth rates, revenues for the securities industry as a whole have dropped sharply. Quarterly revenues for the entire sector are currently between \$50 – 60 billion, compared to nearly \$90 billion at the height of the securities market boom during 2000 (Exhibit 35). Expenses have dropped in parallel, demonstrating that the industry reacted swiftly to the new market conditions.

**Exhibit 35**



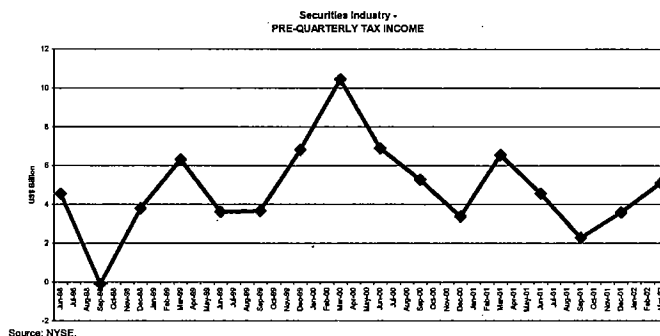
Associated with lower overall revenues, net earnings have declined considerably (Exhibit 36). Although the industry as a whole has avoided net losses, individual firms have suffered negative net results due to earnings short-falls and large write-offs.



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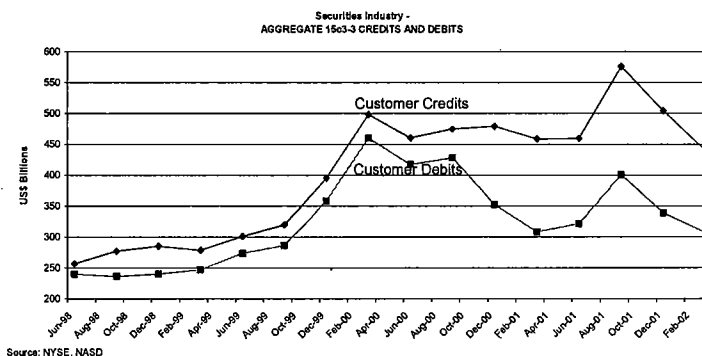


### Exhibit 36



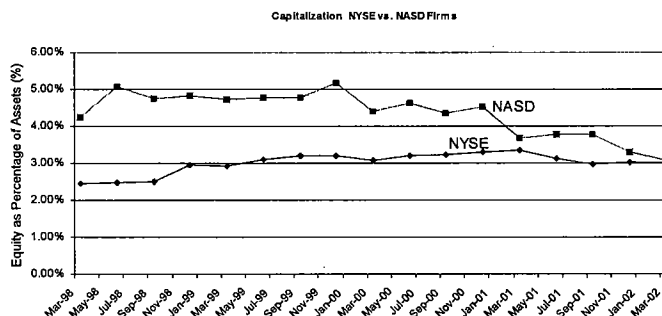
Customers credit balances held with security firms have remained relatively stable during the past two years (Exhibit 37). This can be explained with customer's more conservative use of margin balances during the extended market decline.

### Exhibit 37



Average capitalization levels of NASD and NYSE regulated firms have developed differently over the past two years (Exhibit 38). While NYSE firms have managed to slightly improve their capital bases as a percentage of total assets, the same is not true for NASD regulated firms. Overall, capitalization ratios have dropped by almost 2% compared to June 2000 levels.

### Exhibit 38





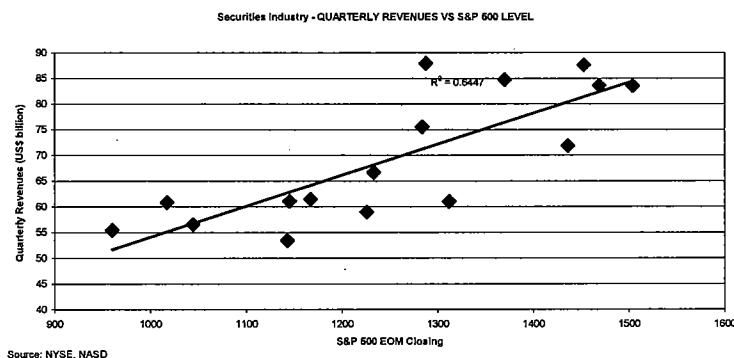
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Total revenues of the securities industry are closely related to the performance of the broad market. Based on a comparison of industry revenues to the closing level of the S&P 500 index over the previous three years, it appears that there exists a significant correlation. Statistically, the level of the S&P 500 index explains the amount of total industry revenues to a degree of 65% (Exhibit 39). In other words, the success of the securities industry is highly dependent on continued market growth.

### Exhibit 39





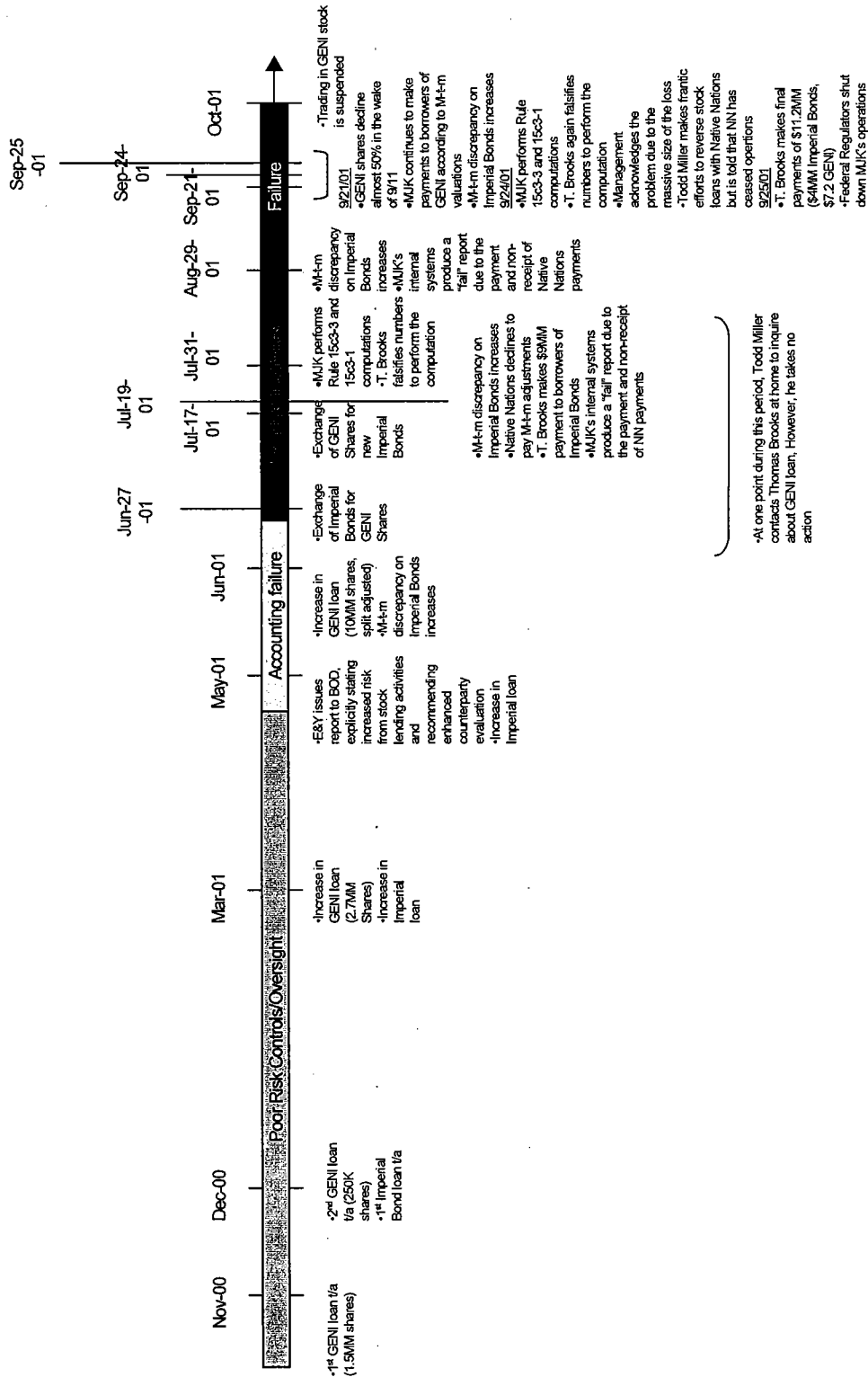


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## 8.2 Timeline of Major MJK Clearing Events





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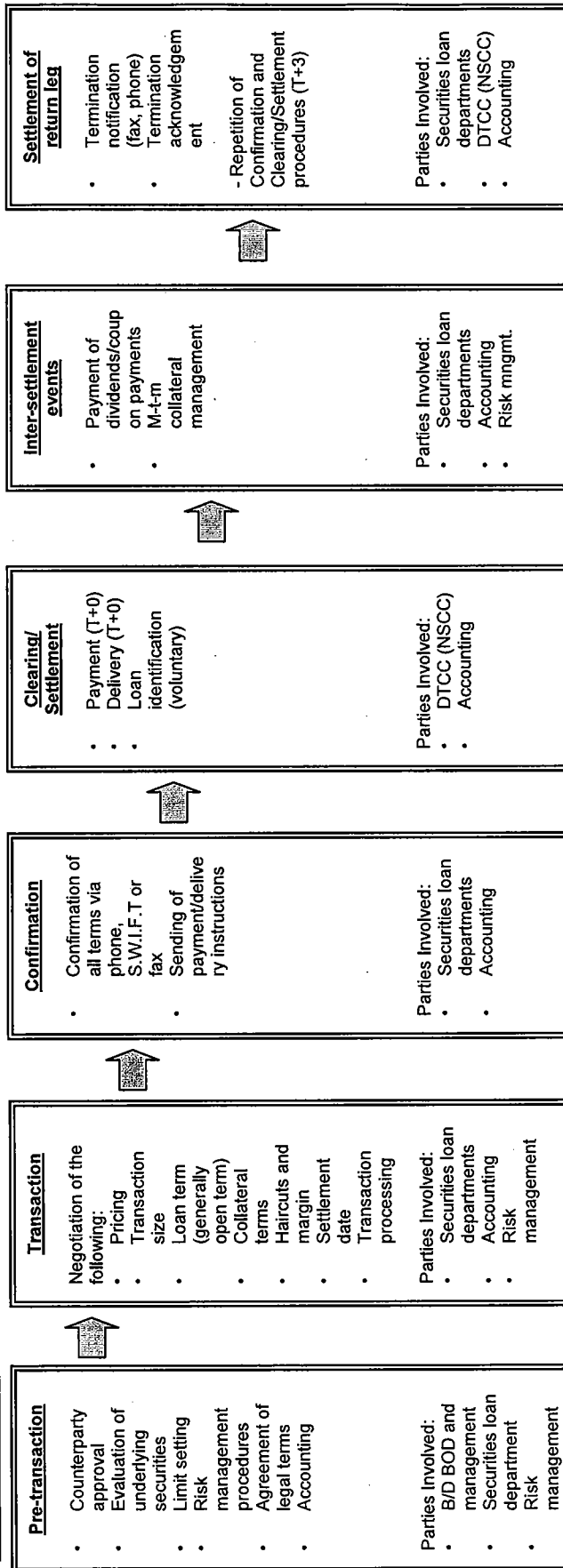


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### 8.3 Stock Lending Transaction Process

Legal and regulatory framework

- SEC: Rule 15c3-3
- FRB: Regulation T (governs extensions of credit by and from B/D's)





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## 8.4 Findings of the 1999 SEC, NYSE, NASD Joint Task-Force

In 1999 the SEC, NYSE and NASD Regulation Inc. convened a joint task force to assess risk management processes of various broker-dealers. The task force found several problems with broker-dealer's risk management processes, including:

- Trading with counterparties for whom no credit limit had been established. In cases where credit limits had been established, limit reviews were undocumented
- Reports used to monitor credit exposure were frequently inaccurate
- Broker-dealers maintained understaffed and inexperienced internal audit departments.
- Many of these internal audit departments failed to include key revenue producing and functional areas in the internal audit plans.
- Internal audit failed to follow up on its findings.

Based on its findings, the joint task force issued the following key recommendation:

*'Senior management must play a significant role in the adoption and maintenance of a comprehensive system of internal controls and risk management practices. - This role should include the recognition of risk management as an essential part of the business process, management's willingness to fund the necessary elements of a risk management system, including personnel and information technology costs, and recognition that risk management is a dynamic function that must be modified and improved as a firm's business changes and improved processes and procedures become available.'*